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COMPUTE

PC

PC View

PC-1

CLIFTON KARNES

We tend to think of PCs as high-powered calculators, but they're much more than that—they're expert communicators.

Feedback

PC-4

READERS

It's possible to use large amounts of extra RAM memory as a simulated disk drive. Here's how to set one up.

Multitasking Showdown

PC-10

JACK NIMERSHEIM

If you could turn your single-tasking DOS-based PC into a multitasking tool, would you be interested?

IntroDOS

PC-18

TONY ROBERTS

XCOPY is a clear improvement over COPY, but many users ignore it. With a choice of eight possible switches, it's hard to know where to begin. Why use XCOPY? It's faster, more powerful, and smarter.

News & Notes

PC-22

ALAN R. BECHTOLD

Ashton-Tate listens to dBase users, microchip giants may be a little worried about Gilbert Hyatt, *The New Print Shop Companion* hits the streets, and more.

Online

PC-24

GEORGE CAMPBELL

If you're tired of being put on hold when you call a support line, there's an answer as close as your modem.

PC Disk Update

PC-26

JOYCE SIDES

If you've called the technical support department during our transition period, we'd like to thank you for your patience. We're trying a different approach to technical support.

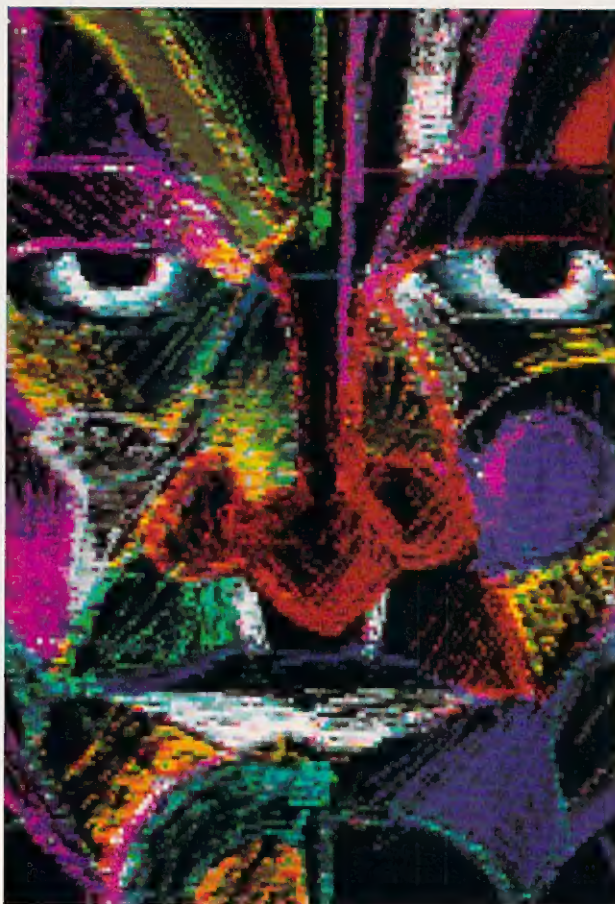
Hot Tips

PC-28

READERS

Run any program on your hard drive, use ANSISYS to set your screen colors, scroll with WordPerfect, and swap the contents of two files.

COMPUTE is looking for exceptional computer-generated art for use on future covers and with feature articles. If you're a computer artist interested in national exposure, send us examples of your work in either color slide or transparency format. Include a brief note listing the title of the work and the hardware and software used in its creation. Please address your samples to Art Director, COMPUTE Publications International Limited, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408.



AMIGA RESOURCE

Amiga View

A-1

DENNY ATKIN

Is Amiga software competitive?

News & Notes

A-2

HARV LASER and SHELDON

"THE EAR" LEEMON

News, new products, and insider gossip.

Opening New Windows

A-6

PEGGY HERRINGTON

The Amiga operating system takes a giant leap forward with the release of Workbench 2.0. Why should you jump with it?

Feedback

A-12

READERS and EDITORS

Getting serious about Amiga math, spreading the word, and fattening up Agnes.

Spotlight

A-13

JOHN FOUST

Adding a hard drive to your Amiga makes it like a new computer.

Abstractions

A-14

ARLAN LEVITAN

Arlan looks at the state of the Amiga and plans a hostile takeover.

CLI Clips

A-16

JIM BUTTERFIELD

Our CLI guru takes a look at how to survive in a rodent-free environment.

On Disk

A-17

Featured on this issue's disk:

GammonX, *Mountains*, *Spheroids*, and *Intuition MakeDir*. Plus the incredibly useful *Mach III*, select "Art Gallery" pictures, and more.

Download

A-26

SHELDON LEEMON

Boot up *Mach III* from this month's *Amiga Resource Disk* and watch your Amiga take off.

Just for Fun

A-28

SHAY ADDAMS

Harry Copperman goes country-and-western, and other amazing predictions and prognostications from our adventuresome columnist.

Art Gallery

A-30

Computer art on display: *Katmandu*, *Rick*, and *Workstation*.

Taking Sides

A-32

RHETT ANDERSON vs.

RANDY THOMPSON

The Commodore Amiga vs. the Sega Genesis: Is the Genesis the best game machine, and does it really matter?

GAZETTE

64/128 View

G-1

TOM NETSEL

Computer show attendees have provided feedback on the magazine's new format, but now we'd like to hear from the rest of our readers.

News & Notes

G-4

EDITORS

A new BASIC enhancement, an updated word processor, and an outrageous adventure are some of the new items in the 64 market.

Reviewer's Choice

G-8

REVIEWERS

Software reviewers pick their favorite programs of the past year.

Feedback

G-18

EDITORS and READERS

Readers ask about combining pictures and text, datasets, delays with arrays, missing type-ins, and establishing electronic bulletin boards.

D'iversions

G-22

FRED D'IGNAZIO

What you see may not always be true, thanks to computerized images.

Beginner BASIC

G-24

LARRY COTTON

Learn how to maneuver eight holiday sprites across your screen.

PROGRAMS

Lander

G-25

PAUL COMSTOCK

Maneuver your spacecraft through hostile fire as you try to deliver needed supplies to space colonists.

List Formatter

G-29

DAVID W. MARTIN

Here's a utility that will increase the readability of BASIC program listings. It's great for printouts, too.

Dissolver

G-30

JESUS MENDOZA ESCALONA

Use this short machine language routine to add drama to your text screens by making text dissolve and materialize at will.

Module 64

G-31

MICHAEL J. GIBBONS

You no longer are restricted to the 64's memory limitations with this utility that loads and links BASIC subroutines or modules from disk.



64/128 VIEW

T O M N E T S E L

During the past month, a number of us at COMPUTE have attended computer shows in the Philadelphia and Chicago areas. The Commodore Users Fair in Valley Forge, Pennsylvania, gave us a chance to introduce the new *COMPUTE* to the public and gauge the reactions.

Many subscribers stopped by our booth during the two-day show to say hello and to voice their opinions about the magazine's new format. After people had a chance to see the magazine, most had favorable comments. There were exceptions, though, and after a while we could almost spot a negative review coming by reading a person's body language. When one man came to our booth, crossed his arms, leaned against a table, and let out a big sigh, we knew we were in for scathing monologue before he said a word.

After voicing their opinions, most people did give us the chance for a rebuttal, especially if they hadn't seen the October issue. After we showed them the new *COMPUTE*, explained how we had merged the different sections under one cover, and assured them that we were not abandoning the 64 and 128, many people said that their preconceived notions about the magazine were wrong and that they liked the look of it.

In this issue we're running a Gazette Readership Survey, asking all of our readers to give us their reactions to the new format. We also want to know how you feel about different columns and features and what you would like for us to cover in future issues. Also, how do you use your 64 or 128? This is an open-ended ques-

tion, and we encourage you to use additional paper if necessary to give us some idea of how you put your computer to work or play. Your responses to these questions will help us provide you with the magazine you want.

Although the number of exhibitors was down this year at the Valley Forge show, many attendees were enthusiastic about their Commodores. One man from Chicago, A. H. Guzzo Jr., was in town on business but took time out to stop by the show and say hello. He was especially interested in the special we were running on *COMPUTE* books for the 64.

A few weeks later at the World of Amiga in Rosemont, Illinois, Mr. Guzzo showed up again. This time he brought his wife and two teenaged daughters with him. Even though it was an Amiga show, he and many other people took advantage of the books we were offering for the 64 and 128. Most of the people who bought

books ordered 2 or 3 of the 15 we had on sale. After examining the titles for several minutes, the Guzzos put their heads together and had a discussion. When I asked them which ones they wanted, Mr. Guzzo said, "All of them!" That's dedication.

Another dedicated 64 owner showed up at the show in Valley Forge. Sandy Carter, a legal secretary in Philadelphia, owns a 64 and is proud of it. That fact was obvious just by looking at her. She came to the show dressed in a white jogging suit, with a large colorful Commodore logo printed on the front of her sweatshirt. While some 64 and 128 owners are upgrading to Amigas, Mrs. Carter isn't one of them. On the arms of her shirt she'd printed, "An Amiga? What's that?" and "An Amiga? Who needs it?"

Mrs. Carter really has nothing against Amigas; she's just content with her 64. It does what she wants. She uses it for word processing and playing games, and she says it handles those chores very well. She sees no reason to abandon her 8-bit computer. Mrs. Carter does have one complaint, though. It seems the postal carrier who delivers her mail insists on shoving her 5¼-inch *Gazette Disk* through the 4½-inch mail slot in her front door. The disk doesn't always survive the final leg of its journey.

Despite her quarrel with her postal carrier, Mrs. Carter is a very upbeat person with an infectious smile. She's pleased with her computer, and she's delighted to talk about it with others. I think there are a lot of 64 owners out there who feel the same way about their 8-bit Commodores. □



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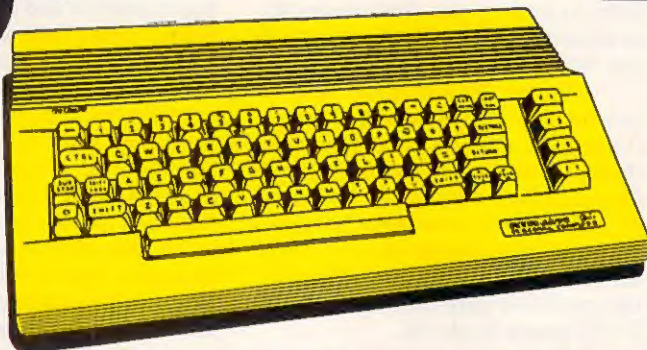
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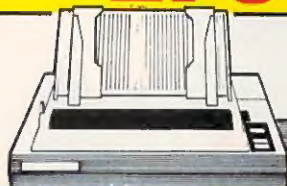
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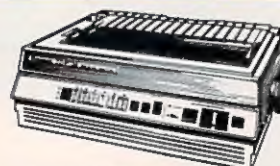


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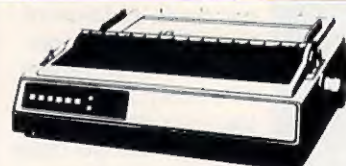


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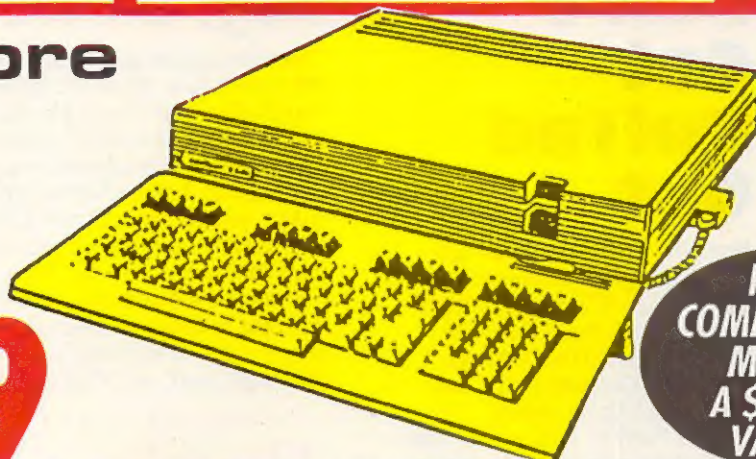
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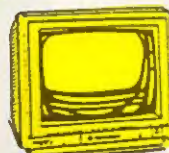
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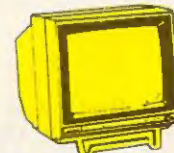
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NEWS & NOTES

Don't Get Puffed Out

Enter the Alien World and face one challenge after another in *Puffy's Saga* (\$29.95), a multilevel arcade-style maze from Ubi Soft (distributed by Electronic Arts, 1820 Gateway Drive, San Mateo, California 94404).

As Puffy or Puffyn, your goal is to advance from one level of a maze to another by collecting Power Goms (power dots). You can also search for Magic Goms that will increase your abilities and speed and give you the option of changing from Puffy to Puffyn.

Race through 20 different levels or explore each one thoroughly, accumulating weapons, energy, and points. Secret passageways may hold keys to hidden treasure chests or acid puddles, one of the many types of enemies you must avoid.

How Fast?

Real R & D (12137 96 Street, Edmonton, Alberta, Canada T5G 1V9) has developed a new BASIC enhancement called *Realfast 64 BASIC* (RFB). RFB (\$30.95) adds more than 90 unsigned integer commands to the 64.

Speed increases of 2-15 times can be expected for 64 software written using RFB. All other BASIC commands can be used without changes, and its structure commands allow you to create new programming words. RFB occupies only 4K of RAM and can be used with other software such as *MetaBasic*.

Hey, Dudes!

Those outrageous guys who took you on a wacky travel through time and history now star in the latest release from Capstone Entertainment (14160 SW 139th Court, Miami, Florida 33186) in *Bill and Ted's Excellent Adventure—The Computer Game* (\$39.95). Based on the hit movie, this arcade/adventure game is available for the 64.

Bill and Ted are failing history class, and only an awesome final report can save them. At the Circle K you meet an ultracool messenger named Rufus and his time-traveling phone booth. Just step in, dial a year, and take off in time. You're on a most excellent adventure to find some famous dudes. Your goal is to bring them back to school for the most bodacious history report of all time. You'll need to find at least 6 of the 12 famous figures to earn a passing grade, or it's work at the burger joint and off to military school for the two of you.

Time for a Word or Five

Timeworks (444 Lake Cook Road, Deerfield, Illinois 60015-4919) has released *Word Writer 5* for the 64. The updated version of this popular word processor allows you to add graphics to your documents with a built-in art library. You can link files to print out long documents, specify page breaks, and mix single-, double-, or triple-line spacing. You can also read, crop, flip, or invert GEOS or Doodle pictures.

And you get all the features *Word Writer* has offered before, including an 85,000-word spelling checker, an integrated thesaurus, a built-in outliner, and an 80-column preview mode.



Fly

Fly, by Jerry A. Shaver and Clifton B. Ryan of Cambridge, Ohio, is this disk's Picture of the Month.

Welcome to "Gazette Gallery." Each month the *Gazette Disk* features a collection of the best 64/128 artwork submitted by our readers. We pay \$50 for each piece of art we accept and an additional \$50 for the one selected as Picture of the Month.

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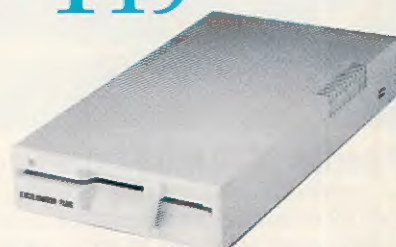
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HD-20 \$599.95 • HD-40 \$799.95 • HD-100 \$1149.95 • HD-200 \$1499.95

SD Series SCSI Hard Drives - Add-on drives for the CMD HD or any other SCSI interfaced computer such as the Amiga™, Macintosh™ or IBM™. SD series drives come mounted in our sturdy steel case and include an external power supply and connecting cable. SD drives also come equipped with a second SCSI port to allow chaining of additional SCSI devices.

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- Supports CMD HD Series Hard Drives and RAMLink.
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HD and SD Hard Drives: Continental US: \$25.00 per drive (UPS ground), \$35.00 (2nd-Day), \$45.00 (Next-Day). Canada: \$50.00 (Airmail). COD to U.S. only \$4.00 add'l charge. Foreign prices: 20Mb, \$699.95, 40Mb, \$899.95, 100Mb, \$1249.95, 200Mb, \$1599.95 Postage: \$35.00
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RAMLink is a multi-purpose hardware interface designed to overcome the limitations of existing RAM expansion units (REUs). RAMLink delivers the performance and compatibility lacking in past REU's by incorporating CMD's proprietary RL-DOS and advanced features into a compact unit which allows most software to utilize Commodore 1700 series REU's, GEORAM, PPI's RAMDrive, and CMD's RAMCard as if it were a disk drive. Optional RAMCard installs internally and can be used alone or in combination with the storage of an external REU for a maximum capacity of 16 Megabytes.

- Supports Commodore 1700, 1764, 1750, Berkeley Softworks GEORAM and PPI's RAMDrive.
- Optional RAMCard allows RAMLink to be used as a RAM Disk with or without a separate REU. User Expandable from 1 Mb to 16 Mb using standard SIMMs.
- Pass-thru connector allows use of cartridge port peripherals such as utility cartridges.
- Reset, Disable, Direct Access mode and SWAP functions are all standard features.
- RAM port provides power back-up to REU's.
- Parallel port provides ultra-fast data transfer when connected to CMD HD series hard drives.
- Includes separate power supply - optional battery available to protect against power failure.

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RAMLink w/ RAMCard (4 Mb)	\$529.95	1 Mb SIMM (User Installed)	\$100.00
RAMLink Battery back-up unit	\$24.95	Parallel Cable for CMD HD	\$14.95

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BOTH RAMLINK AND RAMDRIVE INCLUDE RL-DOS

- Allows vast amounts of commercial software, including GEOS, to access all available RAM as a high-performance RAM Disk.
- RL-DOS performs up to 20 times faster than Commodore RAMDOS, up to 400 times faster than a stock 1541 and provides full DOS command compatibility.
- Up to 32 1541/1571/1581 emulation or Native mode partitions, plus true subdirectories.
- Includes built-in JiffyDOS Kernel for high-speed access to JiffyDOS equipped disk drives.
- Software for copying files (FCOPY) and complete disks (MCOPY) included.
- Many other features, including CMD's exclusive device number SWAP functions.

WHICH ONE IS RIGHT FOR YOU?

Both RAMLink and RAMDrive give Commodore users powerful features never before available in a RAM expander. RAMDrive is intended mainly for those who do not require the high RAM capacity of RAMLink (up to 16 Mb), RAMLink's Pass-Thru port or the parallel port for communicating with the CMD HD Series of hard drives. RAMDrive is an excellent choice for those who desire portability since the internal battery pack can keep the contents of RAMDrive intact for several days. RAMLink is the perfect choice for geoRAM owners who want the ability to use that device with programs other than GEOS. RAMLink has a built-in RAM port for easy use with a geoRAM or Commodore REU. No matter which CMD RAM device you select, you'll benefit from fantastic capabilities of having a high speed RAMDisk equipped with RL-DOS and the outstanding value of CMD support.

What is RAMDrive?

RAMDrive is a fresh new approach to RAM expansion for the Commodore 64 and 128. RAMDrive is a self contained battery backed cartridge with capacities of 512K, 1 Mb and 2 Mb. RAMDrive incorporates RL-DOS, an ultra-fast, easy-to-use operating system similar to the HD-DOS found in CMD HD series hard drives. This proprietary DOS allows various types of partitioning along with compatibility and speed unsurpassed by previous RAM Expansion systems.

- Compatible with vast amounts of commercial software as an ultra-fast RAM disk.
- RL-DOS operates up to 20 times faster than Commodore RAMDOS.
- Power back-up eliminates the loss of files upon powering down the computer while the battery protects data during transportation or power outages.
- Available in 512K, 1 Mb and 2 Mb models at incredibly low prices.
- DOS includes JiffyDOS Kernel routines for high speed disk access with JiffyDOS equipped disk drives.
- Software for copying and GEOS compatibility included.
- Reset switch allows computer reset without losing data in RAMDrive.
- Disable switch allows RAMDrive to be disabled at any time.

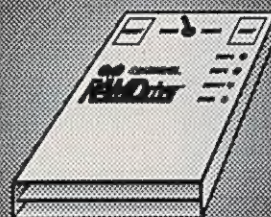
RAMDrive w/512K \$149.95 RAMDrive w/1 Mb \$199.95 RAMDrive w/2 Mb \$289.95

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REVIEWER'S CHOICE



Everybody has a favorite game, and Gazette reviewers are no different. During the past year they've seen practically every major product released for the 64 or 128—and a lot of the smaller ones, too. Since they've had the opportunity to evaluate so many new games, we wanted to know which ones have impressed them most.

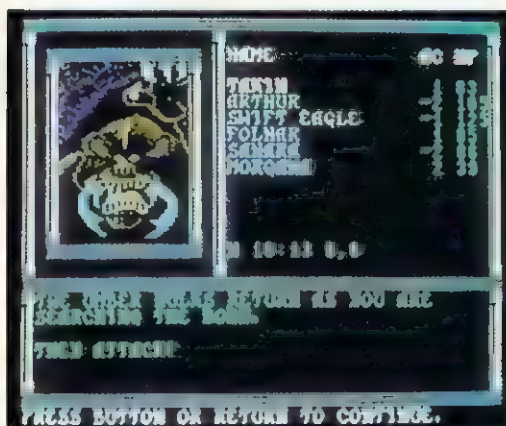
During the past year, we've printed reviews of most of these favorites, and some of the just-released products mentioned will be covered more thoroughly in upcoming issues of *COMPUTE*. While the top choices of our reviewers may not be everyone's favorites, you're sure to find some outstanding games on the next few pages that you'll want to try yourself.

R U S S C E C C O L A

SECRET OF THE SILVER BLADES

The latest in the SSI line of AD & D games, this role-playing epic is the best of the gold-box games so far. Your goal is to defeat the monsters emanating from a mine shaft that leads to a city frozen long ago and eliminate the source of these monstrosities.

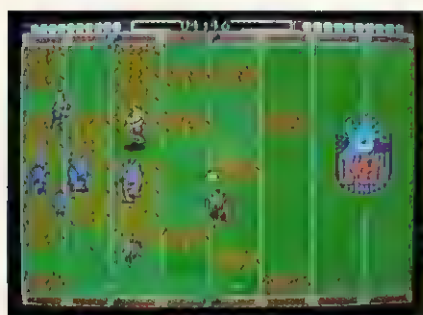
The early games in this series were too difficult to play because of the many battles you had to fight. *Champions of Krynn* corrected this problem, and *Secret* continues what *Champions* started and adds several outstanding features of its own.



In particular, there are new monsters like Umler Hulks and Golems in the game. *Secret* also has the largest 3-D area of all the AD & D games from SSI. There are many new spells, too, and characters can rise to the 15th level (18th for thieves). Put this all together with great graphics and documentation, and you can see why it's the best of the year.

Strategic Simulations
Distributed by Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94404
\$39.95

HONORABLE MENTIONS



GRAVE YARDAGE

How can you not like a game that uses zombies, ghouls, and monsters as players for a football team and a giant eye as the ball? That's what *Grave Yardage* has to offer and more, including play selections, lineup choices, and numerous options found in more conventional football games. Graphics and sounds are great and make this one a perfect choice. Here's a tip for you: Use the Elvis Lives play!

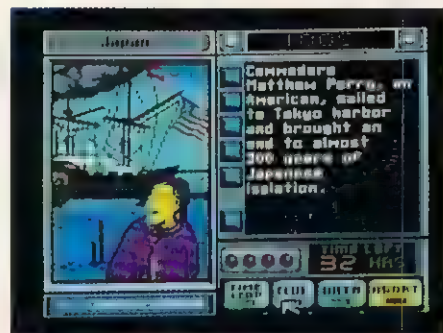
Activision/Mediagenic
3885 Bohannon Dr.
Menlo Park, CA 94025
\$24.95



PUFFY'S SAGA

This game comes from Europe's UBI Soft and is the most addictive level game since *Zoom!* hit the shelves. Choose Puffy or Puffyn as your character, and travel through mazes to find weapons that will help you to escape. With excellent graphics, digitized sounds, and a lot of levels, *Puffy's Saga* is great fun. It's also the best European import of 1990.

UBI Soft
Distributed by Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94404
\$29.95



WHERE IN TIME IS CARMEN SANDIEGO?

Continuing the popular series of educational games that are a hit with children and adults alike, Brøderbund has armed Carmen with a time-travel machine. To help you track down Carmen and her gang and find clues, *The New American Desk Encyclopedia* is included with the game. Colorful graphics and an easy-to-use interface make this a fun mystery game. Plus, it has great educational value. ▶

Brøderbund
17 Paul Dr.
San Rafael, CA 94903
\$39.95

NEW!

ACTION REPLAY v5.0

THE ULTIMATE UTILITY / BACKUP CARTRIDGE FOR THE C64/128

• Action Replay allows you to Freeze the action of any Memory Resident Program and make a complete back-up to disk - and that's not all - Just compare these features:

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SUPER CRUNCHER - ONLY \$9.99

A utility to turn your Action Replay 5 into a super-powerful program compactor. Reduce programs by up to 50%! Further compact programs already crushed by ARS's compactor.

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To take advantage of ARS's unique power, we have prepared a suite of graphic support facilities. **SCREEN VIEWER:** View screens in a 'slide show' sequence.

MESSAGE MAKER: Add scrolling messages to your saved screens with music.

PROSPRITE: A full sprite editor.

ZOOM LENS: Explode sections of any saved screen to full size.

WARP 25

The world's fastest disk serial Turbo. A typical backup will reload in under 5 seconds.

- No special formats - with action replay you simply save directly into Warp 25 status.
- Backup all your existing programs to load at unbelievable speed!
- Warp Save/Load Available straight from Basic.

RAMLOADER

- You can also load most of your commercial originals 25 times faster! With our special LSI logic processor and 8K of onboard Ram, Action Replay offers the world's fastest Disk Serial Turbo.

UNIQUE CODE CRACKER MONITOR

- Freeze any program and enter a full machine code monitor.
- Full Monitor Features
- Because of Action Replay's on Board Ram the program can be looked at in its ENTIRETY. That means you see the code in its Frozen state not in a Reset state as with competitors products.

MORE UNIQUE FEATURES

- Simple Operation: Just press the button at any point and make a complete back-up of any memory-resident program to tape or disk.
- Turbo Reload: All back-ups reload completely independent of the cartridge at Turbo speed.
- Sprite Monitor: View the Sprite set from the frozen program - save the Sprite - transfer the Sprite from one game to another. Wipe out Sprites, view the animation on screen. Create custom programs
- Sprite Killer: Effective on most programs - make yourself invincible. Disable Sprite/Sprite/Background collisions
- Unique Picture Save: Freeze and save any Hires Screen to tape or disk. Saved in Koala, Blazing paddles format
- Compactor: Efficient compacting techniques - 3 programs per disk - 6 if you use both sides.
- Single File: All programs saved as a single file for maximum compatibility.
- Utility Commands: Many additional commands: Autonom, Append, Old, Delete, Linesaver, etc.
- Screen Dump: Print out any screen in 16 Gray Scales. Double size print options.
- Unstoppable Reset: Reset button to Retrieve System and Reset even so called Unstoppable Programs
- Fully Compatible: Works with 1541/C/II, 1581, 1571 and with C64, 128, or 128D (in 64 Mode).
- Disk Utilities: Fast Format, Directory, List, Run and many other key commands are operated by Function Keys
- Unique Restart: Remember all of these utilities are available at one time from an integrated operating system. A running program can be Frozen to enter any Utility and the program is restarted at the touch of a key - without corruption
- LSI Logic Processor: This is where Action Replay V gets its power. A special custom LSI chip designed to process the logic necessary for this unmatched Freeze/Restart power. No other cartridge has this power!

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THE MOST POWERFULL DISK NIBBLER AVAILABLE ANYWHERE AT ANY PRICE!

- Burst Nibbler is actually a two part system - a software package and a parallel cable to connect a 1541 or 1571 to a C-64 or C-128
- What gives Burst Nibbler its power? Conventional nibblers have to decode the data from the disk before it can transfer it using the serial port bus - when non-standard data are encountered they are beat. Burst Nibbler transfers data as raw GCR code via the parallel cable without the need to decode it, so you get a perfect copy of the original.
- Will nibble up to 41 tracks -Copy a whole disk in under 2 min -Installs in minutes - no soldering required on 1541 (1571 requires soldering)

SOFTWARE ALONE - ONLY \$19.99 - CABLE ALONE - ONLY \$19.99

MIDI 64 -Only \$49.99

- ◆ Full specification MIDI at a realistic price
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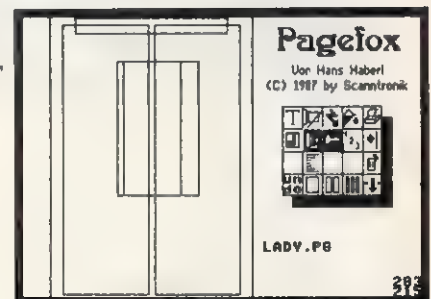
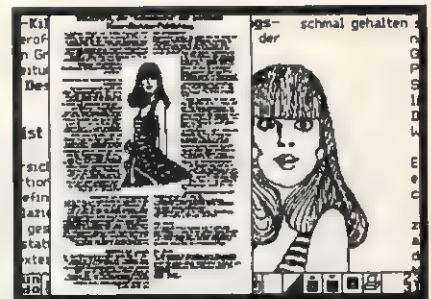
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Finding the elusive 46,000-ton *Titanic* deep in the Atlantic is the culmination of many hours of exploration, beginning with smaller and easier-to-find wrecks. A player accumulates

SEARCH FOR THE TITANIC



and must maintain a reputation as a master treasure hunter by locating, salvaging, and delivering to his or her investors smaller booty in order to earn the clout to finance bigger operations.

Actual digitized pictures of the *Titanic* wreck, taken by the Bob Ballard expedition, are your reward for locating her, plus knowing you're the baddest salvaging dude on the high seas.

Capstone Software
Distributed by IntraCorp
14160 SW 139th Ct.
Miami, FL 33186
\$29.95

HONORABLE MENTIONS



MICRO LEAGUE BASEBALL II ENHANCED

Talk about spending major amounts of time at the keyboard and losing yourself in an alternate universe—this baseball simulation lets you manage and play against the greatest baseball teams of all time.

Have you ever wondered how the great Yankee teams of legend would fare against today's "boys of summer"? Change the rosters, keep stats, trade players, and create series that could only take place in your imagination—or in an Iowa cornfield.

Micro League Sports Association
2201 Drummond Plaza
Newark, DE 19711-5711
\$39.95



GAUNTLET II

Seven types of mutants spring from monster-generating machines, acid puddles surround you, and deadly traps and force fields confound your every move. This could ruin your whole day if you could not assume the role and abilities of Thor the Warrior, Thyra the Valkyrie, Questor the Elf, or Merlin the Wizard. Two players have the option of selecting the heroes they wish to be and then seek out glory and treasure within the 100 mazes.

Mindscape
Distributed by Software Toolworks
60 Leveroni Ct.
Novato, CA 94949
\$29.95



F-16 COMBAT PILOT

Any nation that can muster an air force wants to buy the General Dynamics F-16 Falcon fighter. It is the most complex and deadly machine in the sky, and so is the simulation.

After training, a player takes to the air on five different missions, from tank busting to bogey interception. The final and most challenging multimission, Operation Conquest, is assigned only to those successful pilots who have mastered all the others.

Digital Integration
Distributed by Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94404
\$34.95

DAVID & ROBIN MINNICK

At first glance it would appear strange to choose a board-game crossover as the top game rather than an action-packed racing program or flight simulation. The choice wasn't easy, but Leisure Genius put the same cut-throat attitude that most competitive sports programs feature into its official version of *Scrabble*.

Faced with up to three computer opponents that know no mercy, all of whom are armed with word lists taken from *The Official Scrabble Player's Dictionary* and *Chamber's Words*, even the most mild-

SCRABBLE

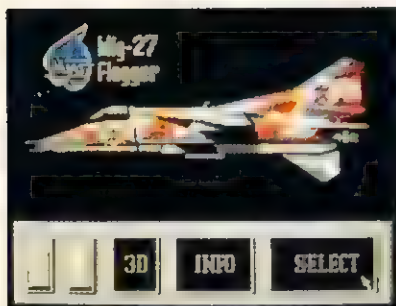


mannered player will learn to come to the computer armed with a dictionary and a military assault rifle.

Scrabble is a great game to bring home, whether you play against your friends or use it to hone your skills. In no time, through the practice of competition alone, you'll be ready to take your rightful place in the *Scrabble Hall of Fame*, right next to Leisure Genius.

Leisure Genius
Distributed by Virgin Mastertronic
711 W. 17th St., Ste. G9
Costa Mesa, CA 92627
\$29.99

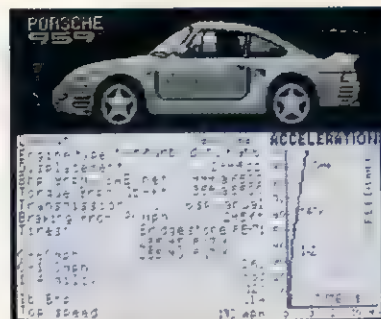
HONORABLE MENTIONS



STRIKE ACES

This program is one more in an ever-growing list of simulation games that set Accolade apart. Participate in SAC's annual Bombing and Navigation Competition to see just how well you can handle any of four fighter/bombers. Accept your mission, load your munitions, and pilot your aircraft over realistic 3-D scrolling landscapes of the South Dakota Badlands. Sweaty-palm entertaining to sweaty-palm educational—that's what we call this excellent adventure!

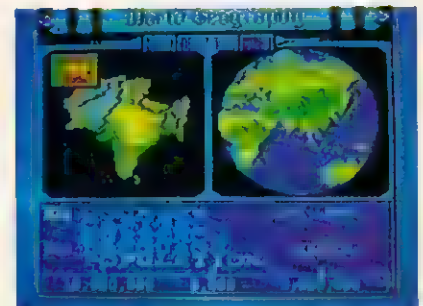
Accolade
550 S. Winchester Blvd.
San Jose, CA 95128
\$39.95



THE DUEL: TEST DRIVE II

Checking out a sports car was never so much fun! Sitting behind your realistic dashboard, pitting your car against another car or against the clock, traversing tremendous graphic scenery, eluding road hazards and police, and parrying clever jibes from the computer are all part of this tension-filled, adrenaline-pumping road run called *The Duel*. Grab this slick package of programming that supports multiple-car and scenery disks.

Accolade
550 S. Winchester Blvd.
San Jose, CA 95128
\$29.95



WORLD OF GEOGRAPHY

An odd choice, to be sure, but who said games can't be educational? *World Geography* is an elegant package that appears simple but represents hard work and some fine programming. Superb eye-catching graphics of maps and globes and flags; snatches of music that entertain and stimulate; and facts about capitals, language, currency, and population make learning geography a challenge and a pleasure instead of a dull and boring chore. >

Bobco
200 Seventh Ave., Ste. 111
Santa Cruz, CA 95062
\$24.95

L E N P O G G I A L I

From the land down under come six sports that will never make the Summer Olympics. These off-beat but entertaining events do, however, make for a lot of fun.

In the Belly Whack, your overweight diver needs as many good breaths as possible so he can spring off the board, go into a horizontal position, and land flat on his tummy.

Equally zany are the Dry River Race, in which you and a friend run with a boat over your heads down a dry river bed, and the Beer Shoot (a.k.a. the Soda Shoot), in which your buddies toss empty bottles from your jeep

AUSSIE GAMES



while you pick them off midair with your trusty shotgun.

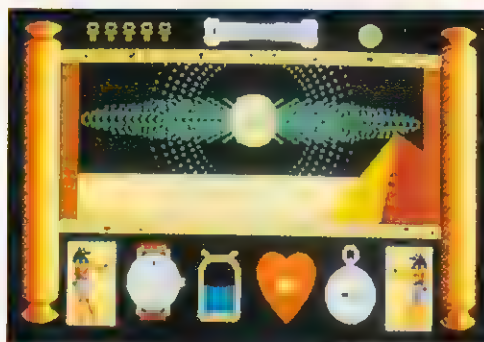
Less bizarre—but also entertaining—are the Boomerang Throw, Marlin Fishing, and Beach Footy, a kickball game played with two-man teams.

Aussie Games provides attractive graphics, tuneful music, appropriate sound effects, a lot of variety, plenty of challenge, and a tongue-in-cheek attitude that's infectious.

Mindscape
Distributed by Software Toolworks
60 Leveroni Ct.
Novato, CA 94949
\$29.95



HONORABLE MENTIONS



MACARTHUR'S WAR

MacArthur's War presents eight varied, entertaining, and historically accurate battles from the Korean War. As field commander, you issue orders to regiments, whose battalions carry out your directives.

You can modify existing scenarios or create new ones by using Warplan, SSG's war-game construction set, and the WarPaint graphics editor.

An easy-to-learn menu system guarantees that you'll be up and playing in no time. Defeating a tough and resourceful enemy won't be as easy.

Strategic Studies Group
1747 Orleans Ct.
Walnut Grove, CA 94598
\$39.95

TOTAL ECLIPSE

Hidden in an Egyptian pyramid is a sacred shrine that carries a deadly curse. To save the world, you must destroy the shrine before the next eclipse of the sun.

Avoiding pitfalls and traps, maintaining your health, replenishing your water supply, defeating enemies, solving puzzles, discovering hidden rooms, negotiating illogical mazes, traversing multitiered chambers, and locating the shrine will keep computer Egyptologists busy for quite some time. You'll have some fun, too.

Spotlight Software
Distributed by Cinemaware
4165 Thousand Oaks Blvd.
Westlake Village, CA 91362
\$29.95

CENTAURI ALLIANCE

As a member of the Centauri Alliance, you tackle a series of missions that entail traveling to twenty-third-century worlds, combating aliens, avoiding deadly traps, and negotiating mazes.

Success requires that your party of eight become expert in wielding weapons, maintaining mechanical and biological systems, changing shapes, and focusing brainwaves.

Entirely menu-controlled, *Centauri Alliance* features a helpful auto-mapping feature and attractive 3-D graphics. Check this one out.

Broderbund Software
17 Paul Dr.
San Rafael, CA 94903
\$29.95

ERVIN BOBO

BATMAN, THE MOVIE

Of all the computer games published as tie-ins with popular movies, *Batman* comes closer to following the actual plot line than any other I can remember.

Divided into several episodes, which can also be considered as levels of difficulty, the game takes you through the vertical maze of the chemical warehouse, lets you race the Batmobile through city streets, and builds toward the final confrontation with the Joker.



This action-adventure game is the best of a long line of movie-related computer products from Data East. Don't confuse this game with *Batman*, *The Caped Crusader*, an earlier release from the same company. Jumping Joker, computer gamers, this one's a winner!

Data East USA
470 Needles Dr.
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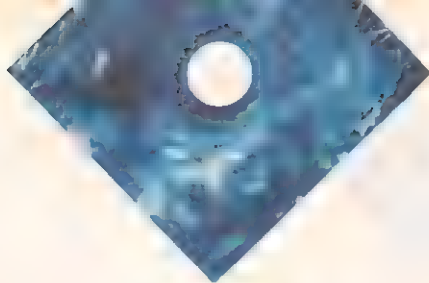
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HONORABLE MENTIONS

HOSTAGE MISSION

Although somewhat improbable even for a computer game, *Hostage Mission* wins important points for its creative use of perspectives. As the action of a hostage rescue mission ensues, you switch from a third-person to a first-person viewpoint. While considered sloppy in novels, the technique works well here and adds to the fun of an otherwise ordinary combat game. Just hang on to your bullet-proof vest; you're going to need it.

Mindscape
Distributed by Software Toolworks
60 Leveroni Ct.
Novato, CA 94949
\$29.95

SGT. SLAUGHTER'S MAT WARS

Although the wrestling action is no better or worse than that in many other personal combat/contact sports simulations, the preliminaries to the matches explore new computer gaming ground. In suggesting that wrestlers are bought and sold, that matches can be bought, and that side bets are as important as the purse, *Mat Wars* lets you partake of the seamy side of sports without ever losing its sense of humor. □

Mindscape
Distributed by Software Toolworks
60 Leveroni Ct.
Novato, CA 94949
\$29.95

ONLY ON DISK

There's something new on the *Gazette Disk*. In addition to the type-in programs found in each issue of the magazine, we offer additional features and programs every month on the *Gazette Disk*. Check out the original 64 and 128 artwork on display in "Gazette Gallery," and look for our bonus programs as well. These programs and their instructions appear only on disk. Here's a description of this month's bonus program.

BAM Aid

Short of accidentally performing a full-format operation, the worst thing you can do to a disk that contains valuable programs and data is to accidentally corrupt its BAM blocks or directory track. If files merely have been deleted or if a short NEW command has been given, then the directory entries are still intact, and the programs can be salvaged. If the directory itself has been corrupted, however, the information is lost.

Until now, that is. With *BAM Aid* you can recover lost directory tracks, BAM blocks, or disk identifiers on any 1541, 1571, or 1581 disk drive. This valuable disk utility and complete documentation can be found only on this month's *Gazette Disk*.

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FEEDBACK

QUESTIONS FROM OUR READERS

Pictures and Text

I am a great fan of role-playing games for the 64 and have been wanting to write my own for quite some time. I have written a few, but they need graphics. I have made some scenes for my games, but I have only been able to show the whole screen in multi-bitmap mode. A friend of mine said there is some way to display a picture and then have text printed at the same time. He thinks it was done by setting rasters, but he doesn't know exactly how it's done. Can you help me out?

JOHN GREEN
FREEPORT, NY

You might try using a split-screen technique for combining graphics with text. Screen splitting takes advantage of the fact that a certain finite time is required for your monitor's electron beam, or raster, to "paint" a picture on the screen. During the time it takes to paint an image on the monitor, the process can be given a different source for its display information, thus combining two display modes such as text and graphics.

On the 128, screen splitting can be handled from BASIC 7.0. On the 64, it can only be done by writing a machine language program for that purpose. Details of the architecture available for this purpose are included in the Commodore 64 Programmer's Reference Guide, pages 150-152. For the code, check out Screen Splitter (COMPUTE!'s Gazette, August 1989). It's a terrific utility for screen splitting.

Datasette Blues

Please let me know how I can get any of your combination BASIC/machine language programs to load properly on my 64 using the Commodore datasette. I've typed in some of your programs, and I get an error message. I've tried changing the loading numbers to indicate the datasette, but I get the same message.

JEFF KRANTZ
LAS VEGAS, NV

Since you didn't specify which error message you're getting, we can't be certain what the problem is. More than likely, the program uses the 64's cassette buffer and other memory locations that make its use with the tape system incompatible. This problem may occur in other programs. Since the vast majority of our readers use a disk drive, we no longer support the datasette.

Frustrating Function

As I was typing in *SynthPlayer* (COMPUTE!'s Gazette, April 1990), I came to a line that said `K$="{f7}"`. The trouble is that my 128 has programmed function keys, and if I press `f7`, it shows LIST. What can I do to correct this?

JOHN E. POTTER
NEW LEXINGTON, OH

SynthPlayer is designed to run on a 64 or on a 128 in 64 mode. You appear to have been entering it in 128 mode. If, however, you are translating from 64 software and need normal function-key usage, redefine the keys as follows.

```
KEY1, CHR$(133) KEY2, CHR$(137)
KEY3, CHR$(134) KEY4, CHR$(138)
KEY5, CHR$(135) KEY6, CHR$(139)
KEY7, CHR$(136) KEY8, CHR$(140)
```

Array Delay

I have written some fairly long BASIC programs that use many and/or large arrays. The same problem seems to arise in each program. While the program is running, the computer will stop and lock up for up to 20 seconds. Do you know what's wrong and how to fix it?

WALTER J. STEGEMILLER
LAWRENCEBURG, IN

Since your computer returns to life after a few seconds, it's not really locked up. The delay could be caused by a couple of things. First, the array may be so large and/or multidimensional that processing

by the program itself may be lengthy. Second, if the BASIC program and its numerical variables occupy a great deal of memory, it may be necessary for the operating system to perform frequent garbage collections—that is, clearing away old string values from the top of memory. During garbage collection other tasks are suspended.

Where Have All the Type-Ins Gone?

I have been a subscriber to both *COMPUTE!* and *COMPUTE!'s Gazette* since 1984. On Monday I received the first issue of your new and improved edition. I can't begin to tell you how disappointed I am with it. You have gone the way of *COMPUTE!* and dropped the type-ins. There were 16 pages devoted to the 64/128, but no projects, games, or programs. The closest thing to programming was something on page 24 referring to *The Automatic Proofreader*.

I had just renewed my subscription through June 1993, but unless I see a radical change in your format, you can count on a cancellation.

THOMAS A. SCHAEFER
ST. PETERSBURG, FL

*Some readers who subscribed to both the old *COMPUTE!* and *COMPUTE!'s Gazette* inadvertently were sent the new *COMPUTE!* subscription edition that does not contain the 16 pages of type-in programs for the 64/128. We believe that mixup has been rectified. If you are a *Gazette* subscriber and your edition of the magazine does not contain the type-ins, please let our subscription department know.*

Setting Up a BBS

I am an elementary teacher with a 64 in the classroom. I have been trying to work out an arrangement with another teacher about 30 miles away who also has a 64. We have experimented communicating with each other using the software that came with the 64

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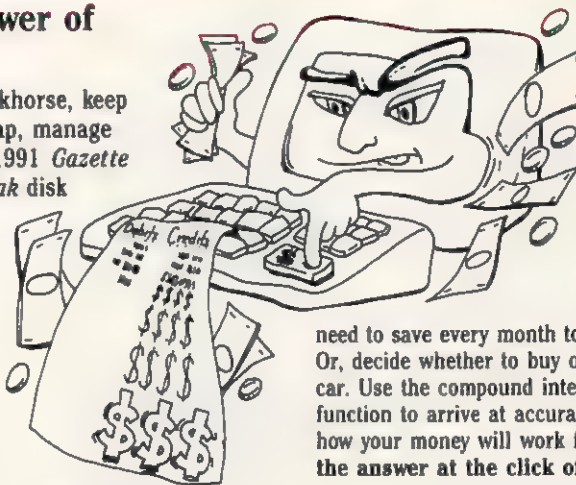
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FEEDBACK *continued from page G-18*

modem. We sent messages to each other during the summer, but our schedules are not always compatible. We can't send and receive information during the same time during the school day.

We're now wondering about sending messages to a bulletin board system (BBS) for reading and replying at another time, but we're not familiar with the process. What would be involved in the way of hardware, software, costs, and restrictions? Do I need to find a BBS that is run on a Commodore to be able to communicate on the system? How involved would it be to start our own BBS for classroom use?

KATHY DOCTOR
YARDVILLE, NJ

If the two of you can communicate directly via computer, modem, and telephone lines, then contacting a BBS should be a breeze. As you already know, to communicate with someone by computer, the only extra hardware you need is a modem, a device that converts your 64's signal into audio tones that can be transmitted by telephone lines. The necessary software is a telecommu-

nications program, often called a terminal program. You can use the one that came with your modem or any of a number of commercial or public domain terminal programs.

If you and your friend can't call each other at the same time, calling a BBS is something like leaving a telephone message on an answering machine. You can call and leave a message for your friend, and then he or she can call and read it whenever his or her schedule permits. With a BBS, however, you can leave more than messages. You can send text files, programs, or graphics. It doesn't matter what computer the BBS is operating on; you can call and access it with any brand.

Setting up your own BBS doesn't require any more hardware, but it does take additional software made especially for the purpose. It also ties up a telephone line. For someone to call in, your line would have to be accessible directly from the outside. Going through the school's switchboard would be impractical. Access to your own BBS could be limited to whomever you wanted. You could give the number

to just a few friends or colleagues for your private use, or you might want to set the BBS up for students to use as well.

For more information on what it takes to set up and run a BBS, be sure to read Gazette in March. Richard Lembrée has been the system operator of his own BBS in Maine since 1984, and he'll share his knowledge and experience with our readers.

Perfectly Puzzling

I would very much like to buy a copy of *Perfect Calc.* Commodore tells me that it is no longer available. I would like to hear from anyone who knows where I can buy this program.

GERALD GOULD
P.O. BOX 1488
APO, NY 09293

Do you have a question, comment, or problem? Have you discovered something that could help other Commodore users? Write to Gazette Feedback, 324 West Wendover Avenue, Greensboro, North Carolina 27408. Due to the volume of mail received, we cannot respond individually to questions. □

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F R E D D ' I G N A Z I O

The other day, while working at my computer, I grew tired of looking at the four walls around me. So I decided to take a voyage—a fantastic voyage of the imagination.

I started by calling up a laser control panel on my computer screen. I popped the videodisc *For All Mankind* from Voyager into the laser player attached to my computer. I clicked my mouse on the SPINUP button on the control panel, and suddenly it was 1961, and there was John F. Kennedy telling the world that America was going to the moon. A few moments later it was 1969, and Neil Armstrong was climbing out of the Apollo spaceship saying, "One small step for man, one giant leap for mankind."

I was on the moon with Neil! (That's how my imagination works, folks!)

For a while I watched my astronaut buddies clowning around on the moon; hopping like bunnies; planting stiff, no-wrinkle flags in the moon's cratered surface; and bouncing around the moon's dunes on their lunar rover. Then I saw the moon picture I wanted and froze it—ZAP!—with one click of my mouse button.

I captured the image with my computer's frame-grabber card and imported it into my favorite paint program. I switched the moon to a second page while I smiled in front of my camcorder. (I always have the camera lens pointed toward my face so I can digitize myself in a flash.)

I digitized a mug shot of myself looking insanely proud (just like the other astronauts). I called up a clip-art image of an astronaut in a spacesuit and placed my grinning face atop the canned, cartoony image.

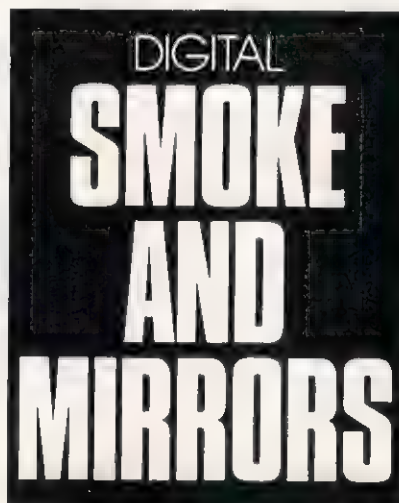
There I was: a smiling, happy guy in a spacesuit. I needed a moon.

I cut out the entire image of me inside the spacesuit and transferred it back to the page with the moon on it. I looked around the moon and finally decided to put myself partly inside a crater. I chopped off the lower half of my body, discarded it into computer-

bit limbo, and lowered the top part of my torso into the crater.

Voilà! Man on the moon! It had taken America almost a decade to accomplish this feat, but it took me only 20 minutes. In a world of digital cutting and pasting—where new virtual realities can be crafted in under an hour—almost anything is possible. Even the sky is no longer the limit.

As with many exotic locations, virtual reality is a fun place to visit, but I'm not sure I'd like to live there.



In virtual reality, distance is only a state of mind. Proof of this occurs every time the phone rings. You press a little crescent-shaped piece of plastic compulsively to your ear. The reality of this is absurd. Anyone from just a hundred or so years ago who saw this would swear you were a swami communing with spirits or some idiot swapping jokes with a carved stick.

But you are oblivious to reality as we know it. You are in virtual reality—talking intimately, arguing, telling jokes, whispering sweet nothings to someone who might be hundreds or thousands of miles away. But there is no distance between you. During your phone conversation (once you rev up and the room around you grows fuzzy and indistinct), you are in Ma Bell's Transporter Room. You and your

phone companion are practically sitting in each other's lap.

It's already possible to take any photograph and digitally retouch it so artfully, so sneakily, that no one could tell whether it was a picture of the real world or a fantasy snapshot.

Take the recent cover of *TV Guide* with the picture of Oprah Winfrey's head on Ann-Margret's body. When the photographer for the story was asked why he had committed such a heinous act (at least, according to Ann-Margret's press agent), he shrugged his shoulders and said, "Because it was so easy I didn't give it a second thought."

Or take the cover of *National Geographic* with the picture of the Sphinx sitting proudly in front of Egypt's great pyramids. This is one beautiful cover. It makes you want to visit Egypt and go there yourself. Except for one thing: *There* isn't really there at all. You couldn't take your Canon Zapsnot to the same spot and snap a similar picture, because that spot doesn't exist. To get the Sphinx next to the pyramids, the photographer digitally moved it and plopped it down just where he wanted it.

This sort of feat once cost hundreds of slaves blood, sweat, tears, and dozens of years to accomplish. Now it takes a dozen minutes.

I know a bunch of high-school kids who hang out in virtual reality. One day they decided to play a trick on their principal. They took a tape of some of his speeches to their computer, digitized several of his remarks, and then cut and pasted the individual words into a new speech that the principal had never made. They recorded a copy of this "virtual" speech and carried it proudly into the principal's office and played it for him.

His reaction was priceless. He was dumbfounded! He recognized his voice, he knew he must have said what he was hearing, but what a speech! Had he suffered a micro attack of amnesia, a short burst of dementia?

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BEGINNER BASIC

LARRY COTTON

Happy New Year! My first New Year's resolution is to finish our multiple-sprite program that we began in December's column. Load that program, and we'll continue by positioning all eight sprites.

```
100 FORT=0TO14STEP2:POKEV+T,X
:NEXT
```

V and X were defined in line 90. Since the sprites' horizontal memory registers are V, V+2, V+4, and so on, we use STEP 2 in the FOR-NEXT loop, which causes every other memory register to be poked. The same goes for the sprites' vertical registers (V+1, V+3, V+5, and so on).

```
110 FORT=1TO15STEP2:POKEV+T,
Y:NEXT
```

Memory registers V+23 (53248+23=53271) and V+29 (53248+29=53277) control sprite height and width, respectively.

For sprite 0, if you POKE V+23,1 and POKE V+29,0, the sprite will be tall and narrow; poking both V+23 and V+29 with a 1 will cause sprite 0 to be tall and wide.

The two sprite-size registers (V+23 and V+29) must be poked very carefully with numbers from 0 to 255. Look at the following chart.

Bit No.	7	6	5	4	3	2	1	0
Values	128	64	32	16	8	4	2	1
On/Off	0	0	0	0	0	0	0	1

Poking 1 to a memory register turns on only bit 0. Poking 4 would turn on only bit 2. Poking a sum of 8 and 16, or 24, turns on bits 3 and 4.

Bit No.	7	6	5	4	3	2	1	0
Values	128	64	32	16	8	4	2	1
On/Off	0	0	0	1	1	0	0	0

Poking a 255 (or K, as defined in line 90) turns on all the bits. The sprites are conventionally numbered the same as the bits. Therefore, poking 1 to V+23 or V+29 controls the size of sprite 0 only. Poking 24 con-

trols sprites 3 and 4. Poking 255 (or K) controls all the sprites. To make all eight as tall and wide as possible, poke V+23 and V+29 with 255 (K).

```
120 POKEV+23,K:POKEV+29,K
```

Memory register V+21 (53269) turns sprites on or off (makes them visible or invisible). To turn all eight sprites on, use POKE V+21,255. (While we're at it, turn the sound on by poking V1 with 23, a funky combination of voice 1, ring mod, and sync.)



```
130 POKEV+21,K:POKEV1,23
```

Now define a few variables.

```
140 J=1:Q=1:F1=1
```

Line 140 is the beginning of a repeatable loop. J starts as 1. Later it will change to -1. Q is the number of pixels the sprites will be displaced from their original locations. F1 is the frequency of voice 1. Now let's make all the sprites green.

```
150 FORT=39TO46:POKEV+T,5:
NEXT
```

Registers V+39 through V+46 control the sprites' colors. Thus, the FOR-NEXT loop assigns color 5 (green) to all eight sprites. Now we need to make a couple of IF-THEN checks to see if the sprites have moved to the extremes of their travel.

```
160 IFQ>MTHENJ=-1:M$="[RED]
MERRY CHRISTMAS":GOSUB300
170 IFQ<0THENM$="(15 spaces)":
GOSUB300:GOTO140
```

Recall that Q is the number of pixels each sprite moves from its original position. M was defined as 79.

When Q becomes greater than M, we want the sprites to reverse direction; thus J becomes -1. Conversely, if Q becomes less than 0, the sprites have returned to their original position, and we begin a new loop at 140.

```
180 Q=Q+J
```

Remember that J can be either 1 or -1. Thus Q will either increase or decrease by 1. Line 190 is reserved for a REMark that explains lines 200-220. Those lines move the sprites by increasing or decreasing their horizontal and vertical locations.

```
200 POKEV,X+Q:POKEV+2,X-Q:
POKEV+5,Y+Q:POKEV+7,Y-Q:
POKEV+8,X+Q:POKEV+9,Y-Q
210 POKEV+10,X-Q:POKEV+11,Y
-Q:POKEV+12,X-Q:POKEV
+13,Y+Q:POKEV+14,X+Q
220 POKEV+15,Y+Q
```

As Q's value increases (J = +1), the sprites move away from each other. As Q decreases (J = -1), the sprites move toward each other.

```
230 POKEVF,F1:F1=F1+J
```

All this does is poke a frequency value to control voice 1's pitch.

```
240 GOTO160
```

We need a subroutine that positions the cursor, prints the message, and causes a short delay.

```
300 POKE214,11:PRINT:POKE211,12:
PRINTM$:FORD=1TO500:NEXT:
RETURN
```

To use sprites of your own creation, change the data in lines 50-70. □



PROGRAMS

PAUL COMSTOCK

In the year 2450, the universe is an unfriendly place. Planets are at war. Many outlying planets have been colonized, but the inhabitants need goods and supplies from the other colonies. Warring factions have set up blockades to stop these necessary supplies from arriving. It's your job as one of the few brave blockade runners to get the goods through.

Interspatial treaties guarantee your safety once you've landed, but landing at a space port is the problem. You must maneuver your craft through the unfriendly fire of the blockaders, avoid the dangerous mountains that surround the landing sites, and keep an eye on your dwindling fuel supply.

Typing It In

Lander is written entirely in machine language. Enter the program with *MLX*, the machine language entry program; see "Typing Aids" elsewhere in this section. When *MLX* prompts you, respond with the values given below.

Starting address: 0801

Ending address: 2230

Before exiting *MLX*, save a copy of the program to disk.

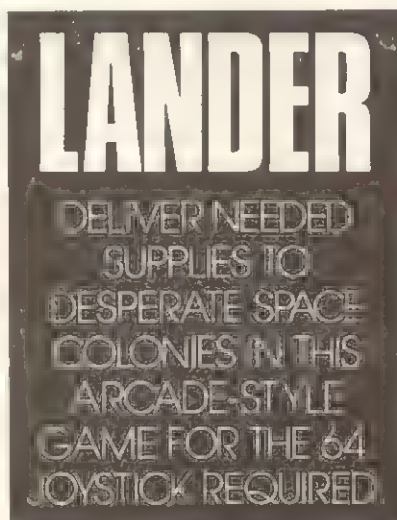
Fire Retro Rockets

Plug your joystick into port 2 and then load and run *Lander* just as you would a BASIC program. After the title screen appears, hit any key to begin play. The playing screen is a two-dimensional image of a planet's landing site. The planet itself is black, buildings and cities appear bright yellow, and the landing pad and your ship are white. Your score, amount of fuel remaining, and number of remaining ships are posted at the bottom of the screen. You start with five ships and 1000 units of fuel.

The joystick controls the engine thrust. Pushing it up engages the main thrust and moves the ship up. Pushing the joystick left or right moves the ship in those directions, respectively.

Once a ship starts moving in a particular direction, it continues in that direction until opposite thrust is applied. All maneuvers consume fuel, so keep an eye on your gauge.

There are ten different planets that you must resupply, and each has a unique landing approach. Once you've successfully landed, your score is increased by the amount of fuel you have remaining. You then move immediately to another planet, so be prepared.



If you crash, get shot, or land too hard, your ship will be destroyed. If you have more ships, you'll start on the same planet with the same amount of fuel as when you were destroyed. If your fuel supply was below 500 units, however, you'll start with 500 units. After your last ship has been destroyed, press the fire button to start a new game.

Master the Blaster

Do not overcontrol. It takes time to overcome inertia and change direction. Take advantage of gravity, and plot a deliberate course to your goal. Don't rush. Speed only wastes fuel.

Note that a blockader will not fire until the first shot leaves the screen or hits something. Pay attention to the timing of shots. Happy landings!

LANDER

```
0801:0B 08 0A 00 9E 37 39 37 55
0809:36 00 00 00 00 00 8D 34 83
0811:03 A9 05 85 FA A9 68 85 DA
0819:F9 38 AD 34 03 E9 14 8D A2
0821:34 03 90 10 18 A5 F9 69 D3
0829:50 85 F9 A5 FA 69 00 85 5F
0831:FA 4C 1A 08 18 AD 34 03 78
0839:69 14 0A 18 65 F9 85 F9 DD
0841:A5 FA 69 00 85 FA 60 8D 76
0849:35 03 A5 F9 85 FB 18 A5 FA
0851:FA 69 D4 85 FC AD 35 03 38
0859:C9 1B D0 06 A9 07 8D 36 4A
0861:03 60 38 E9 11 90 06 A9 31
0869:07 8D 36 03 60 A9 00 8D 8E
0871:36 03 60 AD 35 03 A0 29 64
0879:91 F9 60 AD 35 03 0A 0A 8B
0881:18 69 80 8D 35 03 A0 00 D7
0889:AD 35 03 91 F9 AD 36 03 2D
0891:91 FB EE 35 03 AD 35 03 D6
0899:A0 01 91 F9 AD 36 03 91 E9
08A1:FB EE 35 03 AD 35 03 A0 2B
08A9:28 91 F9 AD 36 03 91 FB 29
08B1:EE 35 03 AD 35 03 A0 29 E1
08B9:91 F9 AD 36 03 91 FB 60 E0
08C1:0A A8 B9 CF 08 85 FD C8 50
08C9:B9 CF 08 85 FE 60 17 15 C0
08D1:B7 15 57 16 F7 16 97 17 AD
08D9:37 18 D7 18 77 19 17 1A 70
08E1:B7 1A 20 C1 08 A2 00 8A C9
08E9:20 0F 08 8A A8 B1 FD 20 9F
08F1:48 08 20 7C 08 E8 E0 A0 3A
08F9:D0 ED 60 AD 00 DC 29 01 9B
0901:C9 01 F0 0C 20 3A 09 20 33
0909:D9 0A EA EA EA 4C 14 09 50
0911:20 71 09 AD 00 DC 29 04 55
0919:C9 04 F0 0A 20 A8 09 20 A5
0921:D0 0A EA EA EA 60 AD 00 5E
0929:DC 29 08 C9 08 F0 09 20 C7
0931:DF 09 20 C7 0A EA EA EA B2
0939:60 AD 3B 03 C9 00 F0 1D CB
0941:38 AD 3B 03 ED 3E 03 90 71
0949:04 8D 3B 03 60 38 AD 3E D5
0951:03 ED 3B 03 8D 3C 03 A9 05
0959:00 8D 3B 03 60 18 AD 3C 61
0961:03 6D 3E 03 B0 04 8D 3C 35
0969:03 60 A9 FF 8D 3C 03 60 0E
0971:AD 3C 03 C9 00 F0 1D 38 9C
0979:AD 3C 03 ED 3F 03 90 04 DB
0981:8D 3C 03 60 38 AD 3F 03 C9
0989:ED 3C 03 8D 3B 03 A9 00 14
0991:8D 3C 03 60 18 AD 3B 03 D0
0999:6D 3F 03 B0 04 8D 3B 03 6D
09A1:60 A9 FF 8D 3B 03 60 AD 7B
09A9:39 03 C9 00 F0 1D 38 AD 6C
09B1:39 03 ED 3D 03 90 04 8D A2
09B9:39 03 60 38 AD 3D 03 ED 0F
09C1:39 03 8D 3A 03 A9 00 8D D2
09C9:39 03 60 18 AD 3A 03 6D 90
09D1:3D 03 B0 04 8D 3A 03 60 55
09D9:A9 FF 8D 3A 03 60 AD 3A 45
09E1:03 C9 00 F0 1D 38 AD 3A 56
09E9:03 ED 3D 03 90 04 8D 3A BA
09F1:03 60 38 AD 3D 03 ED 3A 8B
09F9:03 8D 39 03 A9 00 8D 3A EA
0A01:03 60 18 AD 39 03 6D 3D 7A
```


0A09:03	B0	04	8D	39	03	60	A9	64	0CB9:04	20	32	0C	60	C9	02	D0	E1	0F69:8D	3C	03	60	AD	46	03	C9	1A	
0A11:FF	8D	39	03	60	18	AD	37	D5	0CC1:04	20	63	0C	60	20	72	0C	85	0F71:00	D0	0A	AD	47	03	C9	01	BA	
0A19:03	6D	39	03	60	18	AD	37	00	0CC9:60	20	A4	11	20	48	0B	60	58	0F79:F0	30	4C	E0	0F	A9	00	8D	60	
0A21:04	20	77	0A	EA	38	AD	37	99	0CD1:AD	0D	D0	C9	20	F0	26	CE	9A	0F81:46	03	A9	01	8D	47	03	A9	02	
0A29:03	ED	3A	03	8D	37	03	B0	B1	0CD9:0D	D0	AD	10	D0	29	40	C9	D8	0F89:78	8D	4A	03	A9	10	8D	4B	B4	
0A31:04	20	9F	0A	EA	18	AD	38	2F	0CE1:40	F0	0B	AD	0C	D0	C9	00	C9	0F91:03	A9	0C	8D	05	D4	A9	18	DC	
0A39:03	6D	3B	03	8D	38	03	90	A5	0CE9:F0	13	CE	0C	D0	60	18	CE	E0	0F99:8D	06	D4	A9	00	8D	00	D4	40	
0A41:04	20	6A	0A	EA	38	AD	38	19	0CF1:0C	D0	10	08	AD	10	D0	29	3F	0FA1:A9	18	8D	01	D4	A9	81	8D	3A	
0A49:03	ED	3C	03	8D	38	03	B0	16	0CF9:BF	8D	10	D0	60	20	69	0D	C7	0FA9:04	D4	AD	47	03	C9	02	F0	5D	
0A51:03	20	56	0A	60	AD	01	D0	E6	0D01:60	AD	10	D0	C9	20	F0	04	1A	0FB1:12	CE	4A	03	D0	26	A9	80	F8	
0A59:C9	22	F0	0C	CE	01	D0	CE	A4	0D09:CE	0D	D0	60	20	69	0D	60	0F	0FB9:8D	04	D4	A9	02	8D	47	03	AC	
0A61:03	D0	CE	05	D0	CE	07	D0	F5	0D11:AD	0D	D0	C9	20	F0	25	CE	D9	0FCL:4C	DD	0F	CE	4B	03	D0	14	68	
0A69:60	EE	01	D0	EE	03	D0	EE	A5	0D19:0D	D0	AD	10	D0	29	40	C9	1A	0FC9:A9	00	8D	47	03	8D	00	D4	06	
0A71:05	D0	EE	07	D0	60	AD	10	FD	0D21:40	D0	0B	AD	0C	D0	C9	48	4B	0FD1:8D	01	D4	8D	04	D4	8D	05	FD	
0A79:D0	29	0F	C9	0F	D0	07	AD	36	0D29:F0	12	EE	0C	D0	60	EE	0C	D0	0FD9:D4	8D	06	D4	4C	1C	10	AD	74	
0A81:00	D0	C9	48	F0	17	18	EE	8A	0D31:D0	D0	AD	10	D0	09	40	D9		0FE1:54	03	C9	01	D0	21	A9	40	D2	
0A89:00	D0	EE	02	D0	EE	04	D0	EA	0D39:8D	10	D0	60	20	69	0D	60	5F	0FE9:8D	05	D4	A9	0F	8D	06	D4	E3	
0A91:EE	06	D0	D0	D0	AD	10	D0	AD	0D41:AD	42	03	C9	00	D0	D0	AD	CA	0FF1:A9	00	8D	00	D4	A9	18	8D	A1	
0A99:0F	0F	8D	10	D0	60	AD	10	1C	0D49:1B	D4	4A	4A	4A	4A	4A	6E		0FF9:01	D4	A9	81	8D	04	D4	A9	EA	
0AA1:D0	29	0F	C9	0F	F0	07	AD	DE	0D51:8D	42	03	60	C9	01	D0	04	21	1001:00	8D	54	03	4C	1C	10	A9	DB	
0AA9:00	D0	C9	10	F0	17	38	CE	4F	0D59:20	D1	0C	60	C9	02	D0	04	7B	1009:00	8D	00	D4	8D	01	D4	8D	81	
0AB1:00	D0	CE	02	D0	CE	04	D0	8E	0D61:20	02	D0	60	20	11	0D	60	73	1011:05	D4	8D	06	D4	8D	04	D4	B4	
0AB9:CE	06	D0	10	08	AD	10	D0	B9	0D69:20	AD	11	20	96	0B	60	AD	72	1019:8D	54	03	AD	48	03	C9	00	32	
0AC1:29	F0	8D	10	D0	60	AD	15	D1	0D71:0F	D0	C9	20	F0	26	CE	0F	4F	1021:D0	0A	AD	49	03	C9	01	F0	A8	
0AC9:D0	09	02	8D	15	D0	60	AD	FB	0D79:D0	AD	10	D0	29	80	C9	80	D5	1029:30	4C	31	EA	A9	00	8D	48	F9	
0AD1:15	D0	09	04	8D	15	D0	60	C8	0D81:F0	0B	AD	0E	D0	C9	00	F0	0C	1031:03	A9	01	8D	49	03	A9	02	E1	
0AD9:AD	15	D0	09	08	8D	15	D0	26	0D89:13	CE	0E	D0	60	18	CE	0E	BE	1039:8D	4C	03	A9	10	8D	4D	03	82	
0AE1:60	20	99	11	A9	C5	8D	F8	EA	0D91:D0	10	08	AD	10	D0	29	7F	89	1041:A9	04	8D	0C	D4	A9	14	8D	AC	
0AE9:07	A2	00	A0	00	C8	C0	FF	D8	0D99:8D	10	D0	60	20	08	0E	60	3C	1049:0D	D4	A9	84	8D	07	D4	A9	7E	
0AF1:D0	FB	E8	E0	F0	D0	F4	A9	F6	0DA1:AD	0F	D0	C9	20	F0	04	CE	A8	1051:30	8D	08	D4	A9	81	8D	08	B3	
0AF9:C6	8D	F8	07	A2	00	A0	00	BA	0DA9:0F	D0	60	20	08	0E	60	AD	74	1059:D4	AD	49	03	C9	02	F0	12	F2	
0B01:C8	C0	FF	D0	FB	E8	E0	F0	EE	0DB1:0F	D0	C9	20	F0	25	CE	0F	8B	1061:CE	4C	03	D0	26	A9	80	8D	CF	
0B09:D0	F4	A9	C7	8D	F8	07	A2	77	0DB9:D0	AD	10	D0	29	80	C9	80	16	1069:0D	D4	A9	02	8D	49	03	4C	7D	
0B11:00	AD	00	C8	0C	FF	D0	FB	7F	0DC1:D0	0B	AD	0E	D0	C9	48	F0	CC	1071:31	EA	CE	4D	03	D0	14	A9	C0	
0B19:E8	E0	F0	D0	F4	60	EA	EA	F0	0DC9:12	EE	0E	D0	60	EE	0E	D0	23	1079:00	8D	49	03	8D	07	D4	8D	16	
0B21:EA	A9	C6	8D	FE	07	60	EA	80	0DD1:D0	08	AD	10	D0	09	80	8D	46	1081:00	D4	8D	0B	D4	8D	0C	D4	07	
0B29:EA	EA	A9	C6	8D	FE	07	60	E7	0DD9:10	D0	60	20	08	0E	60	AD	25	1089:8D	0D	D4	4C	31	EA	A0	00	89	
0B31:EA	EA	EA	A9	C6	8D	FE	07	E2	0DE1:43	03	C9	00	D0	0D	AD	1B	C8	1091:B9	9D	10	99	C0	07	C8	C0	06	
0B39:60	A9	FF	8D	0E	D4	8D	0F	B5	0DE9:D4	4A	4A	4A	4A	4A	4A	8D	8C	1099:28	D0	F5	60	20	13	03	0F	29	
0B41:D4	A9	11	8D	12	D4	60	0A	D5	0DF1:43	03	60	C9	01	D0	4A	20	8A	10A1:12	05	20	3D	20	20	20	20	C5	
0B49:0A	A8	A9	6E	85	F9	A9	0B	1D	0DF9:70	0D	60	C9	02	D0	04	20	B3	10A9:20	20	20	20	06	15	05	0C	82	
0B51:85	FA	B1	F9	8D	0A	D0	C8	BD	0E01:A1	0D	60	20	B0	0D	60	20	D9	10B1:20	3D	20	20	20	20	20	20	19	
0B59:B1	F9	8D	0B	D0	C8	B1	F9	30	0E09:B6	11	20	E4	0B	60	A9	32	76	10B9:20	13	08	09	10	13	20	3D	8A	
0B61:4D	10	D0	8D	10	D0	C8	B1	1C	0E11:85	F9	A9	0E	85	FA	AD	40	38	10C1:20	20	20	20	18	AD	18	A0	1C	
0B69:F9	8D	41	03	60	54	C3	00	14	0E19:03	0A	0A	A8	B1	F9	8D	08	9D	10C9:09	20	F0	FF	AE	4E	03	AD	F6	
0B71:03	84	83	00	03	94	C3	00	8C	0E21:D0	C8	B1	F9	8D	09	D0	C8	A8	10D1:4F	03	20	CD	BD	18	AD	18	E6	
0B79:02	44	73	00	03	44	83	00	40	0E29:B1	F9	8D	10	D0	8D	10	D0	EC	10D9:A0	17	20	F0	FF	AE	50	03	81	
0B81:03	84	93	00	03	54	73	00	FC	0E31:60	94	D8	00	00	DC	D8	00	E2	10E1:AD	51	03	20	CD	BD	18	A2	C7	
0B89:03	44	83	00	03	44	73	00	B2	0E39:00	6C	D8	00	00	A0	D8	00	BF	10E9:18	A0	25	20	F0	FF	AE	52	1C	
0B91:03	34	73	00	03	0A	0A	A8	A1	0E41:00	DC	D8	00	00	0C	D8	10	A1	10F1:03	AD	53	03	20	CD	BD	60	AD	
0B99:A9	BC	85	F9	A9	0B	85	FA	83	0E49:00	68	D8	00	00	9C	D8	00	BE	10F9:AD	50	03	C9	00	D0	0C	AD	0B	
0BA1:B1	F9	8D	0C	D0	C8	B1	F9	88	0E51:00	7C	D8	00	00	34	8D	10	3A	1101:51	03	C9	00	D0	00	01	60	38	49
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1B61:00	00	00	00	00	00	FF	FF	97	1E11:FF	FF	FF	FF	FF	FF	FF	00	2E	20C1:00	00	00	00	00	00	00	00	02	
1B69:FF	FF	FF	FF	FF	FF	80	C0	61	1E19:F8	FE	FF	FF	FF	FF	FF	00	91	20C9:00	00	00	00	00	00	00	00	0A	
1B71:E0	F0	F8	FC	FE	FF	7F	BA		1E21:00	00	80	C0	E0	F0	FF	FF	44	20D1:00	00	00	00	00	00	00	00	12	
1B79:3F	1F	0F	07	03	01	FF	FF	85	1E29:FF	FF	FF	FF	FF	FF	F0	F8	50	20D9:00	00	00	00	00	00	FF	FF	1A	
1B81:FF	FF	FF	FF	FF	FF	00	00	B7	1E31:FC	FC	FE	FE	FF	FF	FF	00	FA	20E1:FF	FF	FF	FF	FF	FF	FF	FF	22	
1B89:00	00	00	00	00	00	FF	7F	3F	1E39:00	00	00	00	00	00	00	00	75	20E9:FF	FF	5A	00	00	00	00	00	75	
1B91:3F	1F	0F	07	03	01	00	00	D0	1E41:00	00	00	00	00	00	FF	FF	7D	20F1:00	00	00	00	00	00	00	00	32	
1B99:00	00	00	00	00	00	01	03	D4	1E49:FF	FF	FF	FF	FF	FF	FF	00	85	20F9:00	00	00	00	00	00	00	00	3A	
1BA1:07	0F	1F	3F	7F	FF	01	03	F7	1E51:00	00	00	00	00	00	00	00	8D	2101:00	00	00	00	00	00	00	18	5B	
1BA9:07	0F	1F	3F	7F	FF	FF	FF	FA	1E59:00	00	0F	0F	0F	0F	00	00	1D	2109:00	00	18	00	00	00	00	00	4E	
1BB1:FF	FF	FF	FF	FF	FF	FF	FF	E7	1E61:00	00	F0	F0	F0	F0	FF	FF	43	2111:00	00	00	00	00	00	00	00	53	
1BB9:FF	FF	FF	FF	FF	FF	FF	FF	EE	1E69:0F	FF	00	00	00	00	F0	F0	C3	2119:00	00	00	00	00	00	00	00	5B	
1BC1:FC	F8	F0	E0	C0	80	FF	FE	E7	1E71:F0	F0	00	00	00	00	FF	FF	62	2121:00	00	00	00	00	00	00	00	63	
1BC9:FC	F8	F0	E0	C0	80	00	00	F0	1E79:FF	FF	FF	FF	FF	FF	FF	00	85	2129:00	00	00	00	00	00	00	00	6B	
1BD1:00	00	00	00	00	00	01	01	0B	1E81:00	00	00	00	00	00	FF	FF	BD	2131:00	00	00	00	00	00	00	00	73	
1BD9:03	03	07	0F	0F	0F	80	80	D9	1E89:FF	FF	FF	FF	FF	FF	FF	00	C5	2139:00	00	00	00	00	00	4A	00	10	
1BE1:C0	C0	E0	E0	F0	F0	1F	1F	7B	1E91:00	00	00	00	00	00	00	00	CD	2141:00	11	00	01	44	00	00	29	23	
1BE9:3F	3F	7F	7F	FF	FF	F8	F8	62	1E99:00	00	00	00	00	00	FF	FF	D5	2149:00	00	88	00	00	65	00	00	32	
1BF1:FC	FC	FE	FE	FF	FF	FF	FF	B5	1EA1:FF	FF	FF	FF	FF	FF	FF	00	DD	2151:00	00	00	00	00	00	00	00	97	
1BF9:FF	FF	FF	FF	FF	FF	FF	FF	30	1EA9:00	00	00	00	00	00	FF	FF	E5	2159:00	00	00	00	00	00	00	00	9B	
1C01:FF	FF	FF	FF	FF	FF	FF	FF	39	1EB1:FF	FF	FF	FF	FF	FF	FF	00	ED	2161:00	00	00	00	00	00	00	00	A3	
1C09:FF	FF	FF	FF	FF	FF	FF	FF	41	1EB9:00	00	03	0F	1F	3F	00	00	3D	2169:00	00	DA	00	00	00	00	00	07	
1C11:FF	FF	FF	FF	FF	FF	FF	00	49	1EC1:00	00	C0	F0	F8	FC</													

PROGRAMS

DAVID W. MARTIN

Here's a utility that will greatly increase the readability of your BASIC programs. *List Formatter* makes 64 or 128 program listings easier to comprehend.

If you have a 128, you're probably aware of your computer's larger input buffer that allows you to enter lines in a BASIC program as long as 160 characters. This is considered a big improvement over the 64's capacity of 80 characters per line.

The 128's larger buffer means that BASIC programmers can pack twice as many commands on one line. By doing so, they end up with a program that runs faster (since it has fewer line numbers) but is harder to read. Until now programmers had to decide between a program that was faster yet harder to read or one that was slower but easier to read. Now you can have the best of both worlds with *List Formatter*.

Getting Started

List Formatter is a small machine language program in the form of a BASIC loader. Since it's written in BASIC, enter the program by using *The Automatic Proofreader*; see "Typing Aids" elsewhere in this section. When you've finished entering *List Formatter*, be sure to save a copy to disk.

A unique aspect about *List Formatter* is that it automatically determines which system it's being run on (64 or 128) and configures itself to work within that system. This means you'll only need one copy of the program at any time and you'll never have to worry about which version to load. Load and run the program just as you would any BASIC program.

When *List Formatter* executes, it prints information about how to toggle the program on or off with a SYS call followed by a READY message.

You're then ready to load and list any BASIC program. At this point you can also list *List Formatter* to see how the program works. *List Formatter* patches itself into the IQPLOP vector at 774-775 (\$0306-\$0307), which handles the listing of BASIC text.

The list command itself has not been changed. *List Formatter* looks for a colon on a BASIC program line and formats the line based on the lo-

cation of this character. A colon is often used to separate multiple statements on a line. Once a colon has been found, *List Formatter* prints each statement on its own line with the proper amount of indenting for uniform output. But that's not all.

LIST FORMATTER

MAKE PROGRAM LISTINGS EASIER TO READ WITH THIS UTILITY FOR THE 64 OR 128

List Formatter also highlights remarks (REM statements) in reverse video, making them easier to spot and read. As an example, consider the following BASIC line.

```
500 FORI=0TO100:PRINTI:
NEXTI:REMARKS IN
REVERSE VIDEO
```

Using the standard listing, the line would list as above, but with *List Formatter* the line appears as follows.

```
500 FORI=0TO1
:PRINTI
:NEXTI
:REMARKS IN REVERSE
VIDEO
```

List Formatter is ideal for reading your programs or for printing out copies. Attempting to edit lines in this format, however, is not recommended because the length of the statement in the new format usually far exceeds the line's normal input length. If you must edit a line, first turn *List Formatter* off with the SYS address given when the program first runs.

Also note that the variable S used in the program can be changed to different addresses in memory. This makes the program easy to relocate if

it interferes with another program. Once you use *List Formatter* and discover how readable it makes your BASIC listings, you'll probably find it a welcome addition to your utility library.

LIST FORMATTER

```
BP 100 REM COPYRIGHT 1990 - CO
MPUTE PUBLICATIONS INTL
LTD - ALL RIGHTS RESER
VED
RX 105 IFPEEK(40960)<>148ANDPE
EK(45056)<>191THEN110
GX 106 PRINT"{CLR}{DOWN}SETTIN
G UP C64 MODE...":S=828
:GOTO120
XA 110 S=2816:REM RELOCATABLE
{SPACE}PROGRAM
KM 111 PRINT"{CLR}{DOWN}SETTIN
G UP C128 MODE..."
BP 120 PRINT"{DOWN}LIST FORMAT
TER "
EX 130 REM LIST FORMATTER MACH
INE LANGUAGE
CQ 140 DATA 173,7,3,201,81,144
,6,169
RR 150 DATA 203,162,21,208,4,1
69,81,162
PP 160 DATA 81,141,6,3,142,7,3
,96
DC 170 DATA 8,201,58,208,26,36
,17,48
DQ 180 DATA 22,169,13,32,12,86
,162,0
QG 190 DATA 189,0,1,240,8,169,
32,32
JJ 200 DATA 12,86,232,208,243,
169,58,201
XA 210 DATA 143,208,2,133,243,
40,234,76
EB 230 REM POKE ML STARTING AT
ADDR = S
MF 231 FOR D=S TO S+63:READ Y:
POKE D,Y:T=T+Y:NEXT:REM
ARKS ARE HIGHLIGHTED
RE 290 L=PEEK(774):POKE D,L:POK
ES+14,L
JR 300 H=PEEK(775):POKE D+1,H:P
OKES+16,H
XC 310 M=S+24:L#=M/256
GH 320 POKES+10,L#:POKES+8,M-2
56*L#
GX 325 IFPEEK(40960)=148ANDPEE
K(45056)=191THENGOSUB37
0
HD 330 PRINT:PRINT"ON/OFF: SYS
"S
BA 335 SYS(S):PRINT:PRINT"ENGA
GED":PRINT:LIST231
PP 350 END
RF 360 REM PATCH C128 CODE FOR
C64
CR 370 POKE828+4,167:POKES+36,
71:POKES+37,171:POKES+4
8,71:POKES+49,171
GB 380 POKES+60,199:POKES+30,1
5
PX 390 RETURN
```




PROGRAMS

J E S U S M E N D O Z A E S C A L O N A

To add some zest to your game instructions, messages, or any other text, try this short machine language routine that causes words to dissolve. You can also reverse the process with *Dissolver* and have words slowly appear.

Dissolver hides out of the way of your BASIC programs, ready to be called at any time. It uses one or several collections of 255 characters that may either be defined by you or taken from the 64's standard set.

Typing It In

Dissolver is written in machine language. Enter the program with *MLX*, our machine language entry program; see "Typing Aids" elsewhere in this section. When *MLX* prompts you, respond with the values given below.

Starting address: CE90

Ending address: CFFF

When you've finished typing, be sure to save the program to disk with the name *DISSOLVER.OBJ*. A demonstration program that shows how to use *Dissolver* loads the program and looks for it by that name.

The demonstration program is written entirely in BASIC. To ensure accurate entry, use *The Automatic Proofreader*; see "Typing Aids" elsewhere in this section.

The Commands

To use *Dissolver* in your own programs, make the call *SYS 52880, swcopy, chrset1, chrset2*—where *swcopy*, *chrset1*, and *chrset2* represent numbers that specify how the program will work. If *swcopy* is 1, the program copies the standard 64 character set from ROM. If *swcopy* is 0, the program alternates between any of possibly several character sets that you may have in memory. It reads character data from the set stored at *chrset2* and copies them to the *chrset1* address.

The characters at *chrset1* are copies of the source character set and are visible on the screen. These copies are the characters actually used during the dissolving process.

As a practical example, suppose that your character set is located at memory address 43088 and your copy is to be at address 14336. In this case

the character set is to be a copy of that in ROM. Therefore, the program call would be *SYS 52880,1,14336,43088*. If the character set were to be your own, you would need to poke the characters in starting at 43088 and use 0 in place of 1 as the first parameter in the above call.

Although any values from 0 through 65535 may be used as character set addresses, addresses under Kernal ROM, from 57344 on, are not accessible. Calls from this area will result in garbage.

DISSOLVER

ADD DRAMA TO
YOUR 64 TEXT
SCREENS BY MAKING
CHARACTERS
DISSOLVE AND
MATERIALIZE

Now you can start having fun by dissolving characters. The dissolving process can also be used in reverse, with characters slowly materializing on the screen. To dissolve characters, use *SYS 52963, swdiss, start, end*—where *swdiss*, *start*, and *end* represent more special parameters. The value of *swdiss* must be 0 or 1. Use 0 if you want characters to dissolve and 1 if you want them to materialize. The numbers *start* and *end* may take on any values from 0 to 255 and tell the program what range of characters within your set is to be treated as dissolvable text.

To better understand *Dissolver*, examine the demonstration program and the REM statements that explain the different calls. Then put the program to work spicing up your own text screens.

DISSOLVER.OBJ

```
CE90:20 9E CF 84 02 20 9E CF C5
CE98:8C AC CF 8D AD CF 20 9E 06
CEA0:CF 8C AE CF 8D AF CF A5 8C
```

```
CEA8:02 D0 01 60 A2 05 BD AC F2
CEB0:CF 95 FA CA 10 F8 A9 7F DE
CEB8:8D 0D DC A5 01 29 FB 85 80
CEC0:01 A2 08 A0 00 B1 FE 91 E8
CEC8:FA 91 FC C8 D0 F7 E6 FB A4
CED0:E6 FD E6 FF CA D0 EE A5 5B
CED8:01 09 04 85 01 A9 81 8D 51
CEE0:0D DC 60 20 9E CF 84 02 89
CEE8:20 9E CF 84 03 20 9E CF 26
CEF0:84 04 98 38 E5 03 18 69 3D
CEF8:01 85 23 C9 D2 B0 04 A9 84
CF00:01 D0 02 A9 00 85 24 A2 30
CF08:03 BD AC CF 9D A8 CF CA 25
CF10:10 F7 A4 03 F0 1D 18 A9 50
CF18:08 6D A8 CF 8D A8 CF 18 EF
CF20:A9 08 6D AA CF 8D AA CF C8
CF28:90 06 EE A9 CF EE AB CF 6B
CF30:88 D0 E3 A9 36 85 01 A9 D2
CF38:3F 85 FE A9 07 85 FF A5 47
CF40:23 85 22 A2 03 BD A8 CF 71
CF48:95 FA CA 10 F8 A6 FF BD EB
CF50:B2 CF A8 A6 FE A5 02 F0 40
CF58:05 B1 FC 4C 60 CF B1 FA EB
CF60:3D BA CF F0 04 51 FA 91 43
CF68:FA 18 A9 08 65 FA 85 FA 5E
CF70:18 A9 08 65 FC 85 FC 90 66
CF78:04 E6 FB E6 FD C6 22 D0 E1
CF80:CC A5 24 F0 0A A0 0F A2 17
CF88:00 CA D0 FD 88 D0 FA C6 19
CF90:FE C6 FF 10 AA A5 FE 10 5C
CF98:A2 A9 37 85 01 60 20 FD FA
CFA0:AE 20 8A AD 20 F7 B7 60 7C
CFA8:00 00 00 00 00 30 00 38 41
CFB0:00 D0 05 01 03 06 02 07 70
CFB8:00 04 02 01 02 40 01 20 DC
CFC0:08 10 20 08 40 08 40 01 90
CFC8:04 20 80 02 01 10 08 40 3B
CFD0:20 02 04 40 10 20 02 08 92
CFD8:80 40 08 10 80 04 20 80 9F
CFE0:10 01 01 80 04 80 04 10 2B
CFE8:02 04 40 20 08 02 10 04 01
CFF0:01 80 10 04 20 01 80 02 7B
CFF8:40 08 00 00 00 00 00 BA
```

DISSOLVER DEMO

```
AC 10 REM COPYRIGHT 1990 - COM
      PUTE PUBLICATIONS INTL L
      TD - ALL RIGHTS RESERVED
PS 60 PRINT CHR$(147)
CB 70 POKE 53281,0:POKE53280,1
      1
CK 80 PRINT CHR$(8);SPC(244);C
      HR$(152);"LOADING DISSOL
      VER OBJECT CODE..."
SE 90 A=A+1
MH 100 IF A=1 THEN LOAD "DISSO
      LVER.OBJ",8,1
BG 110 REM *** COPY ROM CHARAC
      TER SET ***
HR 120 SYS 52880,1,14336,40960
XK 130 REM ***** ENABLE ON BLO
      CK ZERO *****
RA 140 POKE 53272,30
JG 150 REM *** DISSOLVE ALL CH
      RS SET *****
PM 160 SYS 52963,0,0,255
EF 170 PRINT CHR$(147)
AH 180 REM *** PRINT 'INVISIBL
      E' LINES ***
SG 190 PRINT SPC(48);CHR$(155)
      ;"DISSOLVER IS A PROGRA
      M"
DJ 200 PRINT SPC(9)" THAT ALLO
```



```

WS YOU TO
AR 210 REM *** UNDISSOLVE HALF
SET *****
MJ 220 SYS 52963,1,0,127
PB 230 FOR T=1 TO 1000:NEXT
KP 240 PRINT SPC(84);CHR$(152)
;"DISSOLVE ONE CHARACTE
R AT A TIME"
DA 250 FOR T=1 TO 1000:NEXT
GD 260 PRINT SPC(56);CHR$(158)
;"01234"
FP 270 FOR C=48 TO C+4
XF 280 REM *** DISSOLVE A CHAR
ACTER *****
JJ 290 SYS 52963,0,C,C
FD 300 NEXT
XS 310 REM ** ANOTHER 'INVISIB
LE' LINES **
CF 320 PRINT SPC(48);CHR$(152)
;CHR$(18);"OR WORK WITH
A GROUP"
XF 330 PRINT SPC(8);CHR$(18);"
{3 SHIFT-SPACE}OF CHARA

```

```

CTERS[SHIFT-SPACE]
[2 SHIFT-SPACE]";CHR$(1
46)
KF 340 REM *** UNDISSOLVE HALF
SET *****
SX 350 SYS 52963,1,128,255
FR 360 FOR T=1 TO 1500:NEXT
BQ 370 PRINT SPC(56);CHR$(158)
;"01234"
HB 380 REM *** UNDISSOLVE FIVE
NUMBERS **
XP 390 C=48
SR 400 SYS 52963,1,C,C+4
FK 410 PRINT SPC(44);CHR$(152)
;"OR WITH A COMPLETE CH
ARACTER SET"
PD 420 REM *** PRINT 255 CHARA
CTERS *****
PG 430 FOR C=0 TO 255
PP 440 POKE 1704+C,C
ER 450 NEXT
PG 460 FOR T=1 TO 1500:NEXT
FX 470 REM *** DISSOLVE FULL S

```

```

ET *****
PX 480 SYS 52963,0,0,255
XE 490 FOR T=1 TO 1500:NEXT
DK 500 PRINT CHR$(147)
CP 510 REM *** PRINT 'INVISIBL
E' LINES ***
AQ 520 PRINT SPC(166);CHR$(155)
;"OR CHANGE BETWEEN DI
FFERENT"
AE 530 PRINT SPC(52)"CHARACTER
SETS."
SC 540 REM *** UNDISSOLVE FULL
SET *****
JA 550 SYS 52963,1,0,255
SJ 560 FOR T=1 TO 1500:NEXT
CK 590 REM *** DISSOLVE OLD SE
T *****
EB 600 SYS 52963,0,0,255
GC 660 FOR T=1 TO 1500:NEXT
FF 670 PRINT CHR$(147)
PM 680 REM *** START AGAIN ***
*****
DR 690 GOTO 120

```

M I C H A E L J . G I B B O N S

Programmers quickly learn through frustration the memory limitations of the 64 when trying to design and write large programs. When confronted with such a problem, one may be tempted to pack the program with as much BASIC code as possible, but this can leave the program difficult to read and filled with potential bugs. *Module 64* is a better alternative.

Module 64 is a machine language routine that loads BASIC subroutines (modules) from disk and links them as needed to form your main program. With this capability, you are no longer restricted to program size, as you can store sections of your program on disk to be loaded and executed as required.

Unlike chained programs, *Module 64* lets you keep your main controlling program in memory at all times, and program variables are accessible to all modules. With *Module 64*, you'll be able to write much larger programs than before.

Getting Started

Module 64 is written entirely in BASIC. To prevent typing errors, use *The Automatic Proofreader* to type it in. See "Typing Aids" elsewhere in this section. When you've finished typing in the main program, be sure to save a copy of the program.

To help demonstrate the power of *Module 64*, we've included a calendar program that has three modules. This demonstration requests you to enter a day, month, and year. The program then displays a calendar of that month. The main program calls modules 1, 2, and 3. Type in each of the three modules and save them to disk separately. Be sure to save them with the appropriate filenames, as the main program will call them by those names.

When run, the demo program will load and call module 3, which will prompt you for a date. Enter any date between 0 and 2300, using the format shown. The program will then load and run module 1, which prints the month, year, days of the week, and a grid pattern used with the calendar. Finally, the demo loads and calls module 2, which prints the dates to the appropriate squares, highlighting the day chosen.

MODULE 64

OVERCOME THE 64'S
MEMORY
LIMITATIONS WITH THIS
PROGRAMMING
UTILITY

This demonstration is rather simple, but it shows how *Module 64* works. When writing your own programs, you can write much larger programs, using as many modules as you want. *Module 64* is best suited for programs that call several interrelated functions upon some type of condition, such as menu selections.

Using the Program

Using *Module 64* is fairly simple, but you must follow a few rules. First, your main program, which will reside

in memory, must begin with line 1000, even if it's just a REM statement. Second, you must include lines 2000-2040 of *Module 64* in your main program. Then a simple GOSUB 2040 reads the data into memory. Third, all the modules must use line numbers less than 1000 and each must end with line number 999. This is so *Module 64* can link the end of the modules to the beginning of the main program.

Finally, you must save your largest module along the main program to disk. This is required so enough space will be allocated at the beginning of your program for the other modules. Notice that in the demo programs the main program begins with line 1000 and each of the modules ends with 999. The largest module, 2, is included within the main program as required. To find which of your modules is the largest, load a module and type PRINT PEEK(46) * 256 + PEEK(45) - 2048.

This will print the size in bytes of each module. All that your main program needs now to load and run a module is to execute the command SYS 49152,"module name" (where module name is the disk name of the module you want to load). Once the module has been loaded, you need only GOSUB to the first line to be executed of that module. You may also execute the above command in direct mode, which will simply load the module and link it to your program if it's in memory.

Keep in mind that you should not use constant strings in modules if you want them to be accessible to other modules or the main program. If you must, make it a concatenated string by adding a null string constant to the end (for example, A\$ = "HOUSE" + ""). This will make certain the string is stored in memory as



PROGRAMS

opposed to being embedded within the module BASIC text.

MODULE 64

```
AF 1 REM COPYRIGHT 1990 - COMP
    UTE PUBLICATIONS INTL LTD
    - ALL RIGHTS RESERVED
RK 10 GOTO 1000
MD 20 LY = 0
AE 30 D = VAL(MID$(CC$,INT(YR/
    100)+2,1))
MG 35 L = YR - INT(YR/100)*100
RA 40 D = D+L:D = D + INT(L/4)
    + VAL(MID$(MC$,MN,1))
PD 50 D=D+1:IF (YR/4-INT(YR/4)
    )=0 AND MN<3 THEN D=D-1:L
    Y=1
CA 60 D=D-INT(D/7)*7+1:IF D>6
    {SPACE} THEN D=0
KB 70 PRINTCHR$(19):PRINT:PRI
    NT:PRINT:PRINT:C=D:A=0:R$
    =CHR$(13)
JJ 75 M=VAL(MID$(MD$, (MN-1)*2+
    1,2)):IF LY=1 AND MN=2 T
    HEN M=M+1
XC 80 PRINT SPC(2+5*C);:FOR L=
    C TO 6:A=A+1:IF A>M THEN
    L=7:GOTO100
MB 85 IF A>M THEN L=7:GOTO100
AR 87 IF A=DY THEN PRINTCHR$(2
    8);
GC 90 PRINT RIGHT$(" "+STR$(A)
    ,2);SPC(3);
HH 100 PRINT CHR$(5);:NEXT:PRI
    NT R$;R$:C=0:IF A<M THE
    N 80
SF 110 PRINT CHR$(19):FOR L=1
    {SPACE} TO 23:PRINT:NEXT
    :PRINT SPC(13);"PRESS
    {2 SPACES}ANY KEY"
JK 120 GETA$:IF A$="" THEN 120
SS 130 RETURN
GG 999 END
CF 1000 DIM MN$(12)
XA 1010 CC$="01234567898765436
    4206420"
KB 1020 MC$="033614625035":MD$
    ="31283130313031313031
    3031"
BK 1030 MN$(1)="JANUARY":MN$(2)
    ="FEBRUARY"
JR 1040 MN$(3)="MARCH":MN$(4)=
    "APRIL"
HA 1050 MN$(5)="MAY":MN$(6)="J
    UNE"
GD 1060 MN$(7)="JULY":MN$(8)="
    AUGUST"
GA 1070 MN$(9)="SEPTEMBER":MN$(
    10)="OCTOBER"
RB 1080 MN$(11)="NOVEMBER":MN$(
    12)="DECEMBER"
BH 1085 POKE53280,14:POKE53281
    ,6
HJ 1090 GOSUB 2040
KC 1100 SYS 49152,"MOD#3":GOSU
    B20 REM GET DATE INPUT
DX 1110 SYS 49152,"MOD#1":GOSU
    B20 REM PRINT GRID
ES 1120 SYS 49152,"MOD#2":GOSU
    B20 REM PRINT DAYS
QF 1130 GOTO1100
AS 2000 DATA 169,3,141,131,192
```

```
,169,232,141,130,192,3
2,84,192,165,251,141,1
32
SG 2005 DATA 192,165,252,141,1
33,192,32,253,174,169,
1,166,186,168,32,186,2
55
HM 2010 DATA 32,158,173,169,13
,208,5,162,22,76,55,16
4,32,166,182,32,189
FS 2015 DATA 255,169,0,32,213,
255,169,3,141,131,192,
169,231,141,130,192,32
PA 2020 DATA 84,192,173,132,19
2,160,0,145,251,173,13
3,192,200,145,251,96,1
69
CM 2025 DATA 8,133,252,169,1,1
33,251,160,2,177,251,2
05,130,192,208,9,200
RA 2030 DATA 177,251,205,131,1
92,208,1,96,160,0,177,
251,72,200,177,251,133
XQ 2035 DATA 252,104,133,251,1
65,252,201,0,208,219,9
6,231,3,170,9,0
JB 2040 M=49152:FORL=0TO132:RE
    ADA:POKEM+L,A:NEXT:RET
    URN
```

MOD#1

```
XD 20 REM COPYRIGHT 1990 - COM
    PUTE PUBLICATIONS INTL L
    TD - ALL RIGHTS RESERVED
QR 21 M$=MN$(MN):PRINT CHR$(14
    7);CHR$(5);SPC((40-LEN(M
    $))/2);M$
QC 25 PRINT SPC(17);YR
JP 30 PRINT:PRINT"{3 SPACES}SU
    N{2 SPACES}MON{2 SPACES}
    TUE{2 SPACES}WED
    {2 SPACES}THU{2 SPACES}F
    RI{2 SPACES}SAT"
MX 40 FOR T=1 TO 6
GK 45 L1$=CHR$(167):L2$=CHR$(1
    75):L3$=CHR$(186)
KK 50 PRINT CHR$(144);:GOSUB20
    0:GOSUB210:GOSUB210:NEXT
    :GOSUB200
DF 55 R$=CHR$(13):PRINT CHR$(1
    9);R$;R$;R$
DH 60 FOR L=1 TO 6:PRINT " ";L1
    $:PRINT SPC(36);L1$
BF 70 PRINT SPC(36);L1$:NEXT:P
    RINT " ";L1$
CP 100 RETURN
BF 200 PRINT"{2 SPACES}";:FOR
    {SPACE}L=1 TO 7:PRINT L
    2$;L2$;L2$;L2$;L3$;:NEX
    T:PRINT:RETURN
RD 210 PRINT " ";:FOR L=1 TO 7:
    PRINT L1$;"{4 SPACES}";
    :NEXT:PRINT:RETURN
GG 999 END
```

MOD#2

```
XD 20 REM COPYRIGHT 1990 - COM
    PUTE PUBLICATIONS INTL L
    TD - ALL RIGHTS RESERVED
HE 21 LY=0
AE 30 D= VAL(MID$(CC$,INT(YR/1
    00)+2,1))
```

```
MG 35 L= YR - INT(YR/100)*100
RA 40 D=D+L:D= D + INT(L/4)+VA
    L(MID$(MC$,MN,1))
PD 50 D=D+1:IF (YR/4-INT(YR/4)
    )=0 AND MN<3 THEN D=D-1:L
    Y=1
CA 60 D=D - INT(D/7)*7+1:IF D>
    6 THEN D=0
KB 70 PRINT CHR$(19):PRINT:PRI
    NT:PRINT:PRINT:C=D:A=0:R$
    =CHR$(13)
JJ 75 M= VAL(MID$(MD$, (MN-1)*2
    +1,2)):IF LY=1 AND MN=2
    {SPACE} THEN M=M+1
XC 80 PRINT SPC(2+5*C);:FOR L=
    C TO 6:A=A+1:IF A>M THEN
    L=7:GOTO100
MB 85 IF A>M THEN L=7:GOTO100
AR 87 IF A=DY THEN PRINTCHR$(2
    8);
GC 90 PRINT RIGHT$(" "+STR$(A)
    ,2);SPC(3);
HH 100 PRINT CHR$(5);:NEXT:PRI
    NT R$;R$:C=0:IF A<M THE
    N 80
JP 110 PRINT CHR$(19):FOR L=1
    {SPACE} TO 22:PRINT:NEXT
    :PRINT SPC(13);"PRESS
    {2 SPACES}ANY KEY"
JK 120 GETA$:IFA$="" THEN120
SS 130 RETURN
GG 999 END
```

MOD#3

```
XD 20 REM COPYRIGHT 1990 - COM
    PUTE PUBLICATIONS INTL L
    TD - ALL RIGHTS RESERVED
FF 21 PRINT CHR$(147):PRINT:PR
    INT
CQ 30 PRINT"ENTER A DATE (MM/D
    D/YYYY):";:INPUT"";A$
BF 40 MN= VAL(LEFT$(A$,2)):DY=
    VAL(MID$(A$,4,2)):YR= V
    AL(RIGHT$(A$,4))
EQ 50 IF MN<1 OR MN>12 THEN90
GX 60 M= VAL(MID$(MD$, (MN-1)*2
    +1,2))
EH 70 IF DY<1 OR DY>M THEN90
DS 80 IF YR<1 OR YR>2300 THEN
    {SPACE}90
MF 85 RETURN
EH 90 PRINT:PRINT"INVALID DATE
    ":PRINT:GOTO30
GG 999 END
```

COMING NEXT MONTH ...

Climbing Your Family Tree

No telling whom you'll meet when you start climbing your family tree, but keeping track of all those ancestors can be quite a chore. Most genealogists compile family group sheets and pedigree charts by hand, but in this article you can learn how genealogy software for your 64 or 128 can simplify your recordkeeping and eliminate much of the paperwork.